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EXPLORATION IN THE JAPANESE ALPS, 1891–1894.*

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So much has been written about the "Land of the Rising Sun" during the last quarter of a century, that it would at first sight seem almost impossible to say anything new. The general characteristics of the people, of their country, and of their institutions have been dealt with over and over again. Books have been written containing observations extending over all imaginable periods of time, varying from 'Nine Years in Nippon' to 'Three Weeks in Japan.' Indeed, one may scarcely look forward to the Ultima Thule, of the downward limit, being reached till the publication of the remarkable work with which residents in Japan have been threatened by their globe-trotting visitors —'Five Minutes in Japan,' in two volumes.

My own apology for venturing to offer a paper on travel in Japan is that the holiday wanderings which furnish the material for it led me almost entirely off the beaten tracks. The districts I visited year after year are several days' journey from the treaty ports and from the usual haunts of those who only take Japan as one of many countries visited during a trip round the world, or on a voyage to or from the East. Without some knowledge of the language and habits of the people, such wanderings would have scarcely been possible, and to the acquisition of this knowledge the average traveller could scarcely be expected to give the necessary time and labour. Several portions of the range were visited some twenty years ago by Mr. William Gowland, F.C.S., etc., late of the Imperial Japanese Mint, who has kindly favoured

* Paper read at the Royal Geographical Society, December 9, 1895. Map, p. 229. The map is based on 'The Geological Survey of Japan—Reconnaissance Map Topography, Division III.'

me with some notes of his explorations. He was the first foreigner, I believe, to climb Yarigatake and Norikura, two of the highest peaks in the range. He went as the representative of one of the Government Departments to report on the mineral character of certain districts, and his observations are very valuable. So far as I can gather, however, scarcely any European seems to have followed him for nearly fifteen years, excepting an occasional traveller across the Harinoki or Nomugi passes. I was induced myself to go to the range six years ago by Professor Chamberlain, and each summer afterwards I returned with greater pleasure. Besides climbing the peaks and traversing the valleys previously visited by Mr. Gowland, I had the pleasure of ascending most of the other mountains, which the natives said had not yet been touched by foreign travellers. The chief of these were O Renge, Jonendake, Kasadake, Hodakayama, and one or two minor ones. I also recrossed several passes which for many years did not seem to have been traversed by any others than an occasional hunter or government surveyor. Since I went, however, almost entirely as a holiday climber, I trust due allowance will be made by those who naturally regard matters of scientific interest as of the chief importance.

In the mountain systems of Japan, two main lines can be clearly distinguished. They are visible not only in relief, but also in geological structure. The first is called the China system, for it is connected with South-East China, and runs up from the south extremity of the Japanese Archipelago in a north-easterly direction. The second is known as the Karafuto system, and enters Japan at its north end from Karafuto (the Japanese name for Saghalien), and runs towards the south-west. These two systems meet near the borders of the provinces of Hida and Shinshu; and it is here, in the middle of Hondo (the main island of Japan), that the country attains its greatest width, and that the mountains assume their noblest proportions in the range which has received from foreign travellers the name of the "Japanese Alps." Curiously enough, the Japanese have no distinctive name of their own, strictly speaking, for this or any other range as a whole. In bygone days polytheistic Buddhism provided each individual summit with a guardian deity, and therefore with a name, as regards the more familiar peaks. The less-known ones in the interior, however, were given titles, descriptive of their personal appearance, by the plain country folk dwelling beneath their shadows; but it has been left to foreign (European) geographers and travellers, like Naumann, Rein, Satow, and Gowland, to deal with and to describe the physical features of the country according to scientific methods.

Roughly speaking, the direction of the range (of the Japanese Alps) is from north to south. Its north end rises in steep granite cliffs from the Sea of Japan exactly on the 37th parallel of north latitude. Its situation and general elevation are about the same as those of the

Sierra Nevada of Spain, which it closely resembles in distant outline. Towering steeply to a height of about 10,000 feet, it is far wilder, more broken, and more difficult of ascent than any other range in Japan. Its impressive appearance is compared by the people of the neighbouring plains to a row of gigantic screens that shut off nearly all communication between the inhabitants of the provinces whose natural boundary it forms. The granite cliffs at the north extremity are known as *Oya shiradzu ko shiradzu*, i.e. "knowing neither parents nor children." In former times the road that now passes high up in the face of the cliffs did not exist, and in order to get between the villages

HODAKAYAMA FROM THE EAST.

on either side of the rocky promontory, one had to make a dash along the beach at its foot whilst the receding tide was still out. It was, however, always a case of *sauve qui peut*, and each man had to "take care of No. 1," as there was no time even to help those nearest and dearest to him. From these granite cliffs, that rise from the Sea of Japan, the range stretches southwards to Norikura, an ancient double-peaked volcano. Then comes a deep saddle, from which rises another extinct volcano, the celebrated sacred mountain Ontake, from which the heights gradually sink towards the south-west. The whole length of the chain is

about 100 miles, and it separates the provinces of Etchū and Hida on the west from those of Echigo and Shinshū on the east.

The range is of dissimilar geological structure, and its peaks are of different ages. Briefly, it may be described as a backbone or axis of granitic rocks, through or over which vast quantities of igneous and volcanic rocks have been poured from time to time. The south end is remarkable for extensive beds of shales near Norikura, where on the east side they are partly overlaid in a very curious way by one of the old lava streams. The most striking volcanic peaks are Tateyama, Norikura, and Ontake. O Renge, Kasadake, and Jonendake are chiefly composed of andesite rocks. But the most beautiful mountains in form are Hodakayama, whose granite towers give it the name of the "mountain of the standing ears of corn"; and its northern neighbour Yarigatake, "the Spear Peak," the Matterhorn of Japan, which consists of an intensely hard, weather-resisting porphyry breccia. These peaks, and the wild broken ridge that connects them, exhibit the most striking mountain scenery in Japan. From the top of Yarigatake, the view embraces practically the whole width of the main island at its broadest span, some 150 miles in extent, from the Sea of Japan nearly to the Pacific Ocean.

Turning from peaks to passes, there is little to be said. The inaccessible character of the range cuts off nearly all intercourse between the people on either side. Starting from its northern extremity, we only find one pass in a distance of 50 miles. This is the Harinoki-toge, "the pass of the alder trees" (8120 feet), leading from Omachi on the east to Toyama, the capital of the province of Etchū, on the west. Since it was originally opened twenty years ago, it has become so damaged by landslips and avalanches that it has been for long practically abandoned, and only an occasional hunter or government surveyor seems to visit it. When I crossed it in 1893, I was told it was many years since any European traveller had been over it, though I knew of two parties that had unsuccessfully made the attempt. The three days' hard work that the crossing takes brings one into contact with some of the wildest of Japanese alpine scenery. Granite cliffs rise thousands of feet above deep-cut ravines, and roaring torrents are fed by slopes of snow that are often encircled by lovely alpine flowers of every hue. Further to the south, a more permanent way has been found across the northern shoulder of Norikura. The Abo-toge leads us through the loveliest of sylvan scenery and torrent-dinned ravines, at a height of 6400 feet, from the plain of Matsumoto eastwards to the plateau of Takayama. This pass connects the two chief silk-producing districts of Japan. A slightly different route, crossing more to the south, known as the Nomugi-toge, is perhaps more popular, as it is practicable for cattle. This also connects the same districts as the Abo pass.

Besides magnificent mountain forms, wild ravines, and wall-like

precipitous cliffs, we find a great abundance of water. Sometimes, it is in the form of a clear lake of solemn stillness; at another it is in charming falls and cascades, or in murmuring streams deep buried in some shady forest gorge.

The eastern side of the range is drained almost entirely by the Hime-gawa and the Saigawa, which both flow northwards into the Sea of Japan. On the west the water is carried off into the bay of Toyama (an arm of the Sea of Japan) by the Jinzu-gawa, the Jogwanjigawa, and the Kurobe-gawa. These last three rivers are notorious for the destruction almost every year caused by the autumnal rains. Rising on the west side of the range, their courses are short, and their currents very swift,

RIDGE SOUTH OF YARIGATAKE, FROM THE NORTH-EAST.

and their broad flat deltas are annually inundated with such rapidity that landslips and great loss of life and property ensue.

The lakes in this region are few. Aoki ko, near the source of the Hime-gawa, and the deep turquoise of the sulphurous crater-pools on Norikura, Tateyama, and Ontake, are very pretty, though insignificant in size.

Erosion on the largest scale is seen between Tateyama and the sea, towards the north-western limits of the range. Here one of the old

name for such phenomena in Japan. As one stands on a little hill, half a mile from the climbers' hut at the base of the final peak, the whole of the valley below appears alive with bubbling pools of boiling mud and sulphur. From clefts in the sides of the mounds that dot the valley, jets of steam and sulphuretted hydrogen burst forth sometimes with a deafening roar, and with force enough to project lumps of the sulphur deposit to a distance of 15 or 20 feet. In some of the pools boiling water of a dark green or yellow colour is shot up to a height of several feet, and as it falls back again into its pit, it is again thrown out with equal violence. It is from such spots as these that much of the sulphur found in Japan is obtained, the deposit sometimes being as much as several feet thick.

It has been very truly remarked that the *grande passion* of the Japanese is hot-water bathing. Cleanliness is one of the few original items of Japanese civilization. Nearly all their other institutions have been introduced from China excepting baths; for the Celestial sarcastically tells us that only such dirty people need to wash so often. But, in spite of the fickleness usually ascribed to the Japanese, their original love for hot water has never grown cold. In the mountains, therefore, wherever hot mineral springs are found, as they frequently are, we find the peasantry resorting to them with a double object in view. Invalids come for the sake of the healing virtues of the waters; their healthy friends come to keep them company, and to kill time pleasantly. The *yuba*, i.e. "hot-water houses," as these bathing-establishments are called, usually nestle at the bottom of some deep ravine, or occasionally are found perched high up on the slope of one or other of the great volcanoes. The bath itself consists of one or more wooden tanks 10 or 15 feet square, fed by water conducted from the mineral spring through bamboo pipes. Overhead is a roof of shingling, but the sides are open to the free air. The temperature of the water varies from 100° to 130° Fahr. In the humbler classes of yuba, the bathers are accommodated in long roughly built shanties divided into cubicles some 10 feet square, each of which is inhabited by six or more persons. For room-rent and the use of the bath each pays about a halfpenny a day, but food and bedding are not supplied. Occasionally, however, the caretaker has a sort of office or store where one may purchase such luxuries as dried fish, sugar, and eggs. At *yuba* of a better class the visitors stay at châlets or inns close by the baths, and in some cases the larger guest-houses have baths on the premises. Both sexes bathe together, but the behaviour of one and all is above reproach. Some years ago, out of deference to European feelings of propriety, a police regulation was issued in the larger towns on the beaten tracks, directing males and females to occupy separate compartments. In many cases, however, where the prowling policeman was not too strict in his interpretation of the rule, the difficulty was overcome by stretching across

the bath a piece of string to denote "This side for ladies, that for gentlemen."

The Japanese in these out-of-the-way mountain resorts indulge their taste for bathing to an incredible extent. In one place I know of,* where the water is just about blood-heat, a man will stay in, it is said, practically for a month on end, taking care, however, to place a heavy stone on his knees, to keep him from floating or turning over in his sleep. The caretaker of this particular establishment, a cheery old man of some seventy summers, himself stays in the bath the whole winter through. In the case of another spot famed for its thermal springs, the inhabitants apologized to a friend of mine for what they called their dirtiness, when he happened to visit their neighbourhood on a holiday

OUTER EDGE OF CRATER OF ONTAKE.

tour. "For," they said, "it is the summer-time, and we are too busy to bathe more than twice a day." "How often, then," he asked, "do you bathe in the winter?" "Oh, then we have more leisure, and we can bathe four or five times a day, and the children get into the water whenever they feel cold"! At some bath-houses I have visited, it is a favourite practice of some of the bathers to while away the time by reciting portions of the popular dramas of the day. The effect of such recitations is said to be greatly enhanced by reason of the acoustic properties of the confined space and the damp air which these places afford to perfection. When the visitors return to their homes from the

* Cf. Chamberlain's 'Things Japanese.'

sulphur springs, they take with them packets of the sulphur deposit to use in their own baths, just as we might employ Tidman's sea salt. It goes by the name of *yu no hana* ("flowers of the hot water"), and is highly prized.

Although the mineral wealth of these mountains seems to be at present imperfectly ascertained, there are one or two silver and copper mines of some importance on the west side of the range. The chief one is near Hirayu, on the west flanks of Norikura, near the source of the Takaharagawa, in the province of Hida. When climbing that mountain by a new route in 1892, I was very hospitably received and entertained by the overseer and his assistants, though I was the first European to visit the place. The mine is at an altitude of 7000 feet, high up the mountain-side, and work goes on all the year round. Some 150 men and women are employed, and I was told the annual output is about 140,000 lbs. of copper and 2500 lbs. of silver. Possibly the latter item is rather above the mark. At the village of Hirayu, 3000 feet lower down, are the smelting furnaces, stores, etc., connected with the mine. Each year I revisited the place, the air of increased prosperity told a tale of growing success.

In the north of the range limestone is found in several places, and is burnt for manure. On Kurodake, the "dark peak," fine rock crystals are dug out, and taken to Osaka and Tokyo for sale. Indeed, the only object the rustics attribute to one's repeated visits to these wild regions is either to search for crystals or for silver mines. Mountaineering for pleasure is too absurd an idea to be treated as serious, though the good folk are far too polite to even pretend to say so.

One of the most remarkable features of the Japanese Alps is the extent and variety of the flora of the region. On the lower flanks of most of the mountains, especially in the southern portion of the range, we find a sort of prairie called *hara*. It is this *hara*, and the mountain woodland generally connected with it, that form the home of that wonderful variety of plants in which Japan is so rich. No one who has not seen something of this "variegated floor of living mosaic" can quite understand the grouping of Japanese plants. The name is well deserved by which the natives sometimes call it, *o hana batake* ("the great flower-field"). Not only does it include many of our familiar English wild flowers, but side by side with them are numbers of our favourite ornamental plants, together with many others quite strangers to us. Besides the more common species, we find the beautiful *Lychnis grandiflora*, and varieties of magnificent lilies (*auratum*, *tigrinum*, etc.) These, with the purple iris and the noble large blue bell of the Japanese *kikyo* (*Platycodon grandiflorum*), give a gorgeous colouring to the face of the field. In the forests the wistaria and the delicate petals of many-tinted hydrangeas light the gloom, and the tall graceful fronds of splendid circular ferns recall the feathery crown of some old-time

Red Indian chieftain. To enumerate the inhabitants of these mountain forests would be to name half the entire flora of Japan. Wild strawberries, raspberries, and gooseberries refresh the climber on his way. On the great granite peak of Hodakayama I discovered, for the first time on record in Japan, the black currant growing wild. On both sides of the range the Japanese Alps bear the most beautiful cypress forests. The wood of these trees, especially that of the *hi-no-ki* (*Chamæcyparis obtusa*), is much valued for lacquer, on account of its

ONO NO TAKI (WATERFALL) ON NAKASENDO.

white colour and other qualities. It is also largely used in building Shinto temples, etc. Near Funatsu, on the west side of the chain, we meet the Japanese yew tree (*ichii* or *araragi*), celebrated for its beautifully grained reddish timber. It is, however, found rather as a shrub than a tree, and is scattered through the forests, not standing in separate clumps. Of forest creepers the most interesting is the *Kadzura japonica*, called by the Japanese *Kurogane modoshi*, i.e. "iron creeper." Its stems are so strong and elastic that they are frequently used as substitutes

for ropes. A curious sort of suspension bridge, of a form now dying out, used to be constructed of them in primitive regions. The other commonest forest trees, besides conifers, are birches, beeches, and oaks. On the latter two, as well as on maples and willows, we sometimes see mistletoe growing. The associations, however, that Christmas-time connects with it amongst ourselves are quite unknown to the Japanese. Indeed, the custom it suggests to us is considered by them to be both barbarous and unhygienic; and a schoolboy I know of one day spontaneously offered his English teacher an essay on the subject entitled "Kys," stating his reasons for holding kissing to be a dangerous practice, and concluding with the sarcastic query, "Is this civilized nations' custom?" Above the upper forest limit (*i.e.* about 7000 feet or so), we find a dwarf pine called *goyonomatsu* ("five-needle pine"). Higher up, the most noticeable plants are a yellow violet, a curious dwarf single-flowered azalea, and (as well as at various other altitudes also) the beautiful Japanese alpine bell, the *Schizocodon soldanelloides*. The latter, both by its form and its dwelling-places, reminds one vividly of its European kinsman, the *Soldanella alpina*. With its lovely bells it encircles the melting snowdrifts in the summer-time, whilst 2000 or 3000 feet lower down it flowers early in the spring. It is both larger and more beautiful than the European sort, and is found over a much more extensive zone. It is probable that the flora of these high mountain regions of Japan, with its peculiar admixture of alpine and northern plant forms, originates from East Siberia and Kamtschatka. From its original home it has been carried southward chiefly by the cold and violent monsoons and currents, and then up the mountains by valley winds.

The land fauna of Japan, generally speaking, principally points to the neighbouring continent, *i.e.* to North China, Korea, and Manchuria. Chief amongst the animals found in this alpine region is the *kuma*, or black bear. It sometimes attains a length of over six feet, and its flesh is smoked and eaten. Its skin, as well as that of the Japanese chamois and other animals, is exposed for sale in the larger villages. In the north end of the range the badger is very common, and is much valued both for its flesh and its fur; but it is also much feared for the power it is supposed to possess of bewitching people. In the forests high up the mountain-sides boars are found. Deer are also hunted in the winter, when the deep snow and beasts of prey, especially wolves, drive them down into the valleys. Hares, which turn white in winter, are trapped, and flying squirrels are not uncommon. One sort of squirrel is called the *momodori*, or "peach-bird," and usually spends the daytime, the light of which it shuns, in hollow tree-trunks. The marten is common, the Japanese name for it, oddly enough, being *ten*.

Of birds, the beautiful golden eagle leads the way, though I have only occasionally seen it, and that in the most solitary places. Besides the

kite, which is common, we have a curious black and white speckled crow, and extremely tame ptarmigan abound near the upper snowfields.

A magnificent specimen of copper pheasant sometimes startles us with its sudden whirr and with the flash of its gorgeous plumage through the upper forest glades. Though the birds of Japan are popularly said (probably by deaf persons) to be songless, the *uguisu*, or nightingale, gives this the lie, as it floods the silence and shade of the lonely forests with its liquid deep-voiced melody. The most remarkable animal of all, however, is now fast dying out. This is the giant salamander (*Cryptobronchus japonicus*) found chiefly in the south-west spurs of the range, as well as in one or two other regions between 34° and 36° N. lat. It appears to have usually preferred the clear mountain streams of granite and schist ranges at a height of 2000 to 4000 feet above the sea. It feeds mostly upon trout (in which these mountain streams abound) and upon the larvæ of insects and the smaller batrachians. Its flesh is valued chiefly for its medicinal uses, and for keeping the water clean in wells. The largest specimens, sometimes 5 feet long, are brought to the principal cities, where they are found as curiosities in naturalists' shops. Whilst its near relatives are found in China and in North America, its closest kinsman of all is the one whose remains were found by Scheuchzer at Œningen. Owing, however, to its weak reproduction and limited distribution, it will probably soon follow its departed cousin, that *homo diluvii testis*, and at no distant date will cease to form part of the living fauna of Japan. In some of the mountain torrents a sort of lizard is found, which is much prized for the sake of its flesh. Numbers are caught, dried, skewered on sticks, and sold as a remedy for the nervous diseases of children. Certain kinds of snakes are also treated in a similar way.

May I now call your attention to some characteristics of the people of these interesting out-of-the-world regions? When once the explorer gets into the mountains, he finds the travel of the roughest character, but the manners of the people are always polished, and exhibit still the perfection of true politeness. Kindly hospitality is met with wherever one goes, and one soon learns to find good breeding is not the exclusive prerogative of a particular class, and that it is not the monopoly of the educated and the well-to-do.

One or two illustrations may serve as types of the whole. During a mountaineering expedition, not previously made by a foreign traveller, near a wild, almost uninhabited valley, the only accommodation I could get was at a solitary *yuba* (bath-house) of the roughest kind. On my arrival with a request for shelter, I was received by an old grey-haired man of threescore and thirteen, who combined the dignity of a prince with the simplicity of a peasant. During the two days I spent under his primitive roof, he treated me with a courtesy and attention that could not be excelled. His only anxiety was that I should find the

accommodation too rough and rude. Without my wishing it, he turned out (as I subsequently discovered) the people who were in the best room he had. He always contrived to let me have the public bath (which, I may mention, was planted just outside the front door) to myself. He made me a present of cakes of the sulphur deposit from the solfatara hard by, to take home to use in my own bath. The only favour he asked me was that, one evening at dinner-time, he might be allowed to come upstairs and sit at the top of the ladder, in the open doorway, to see how and what the foreigner ate at dinner. When I was leaving I asked him what I had to pay for his hospitality. How puzzled the old gentleman was! Shaking his head, he said he really didn't know, as he had never entertained an "honourable Mr. Foreigner before." After much pressing to name his own price, he finally ventured to murmur, with an air almost of shame at the exorbitance of the demand, "Well, really, do you think 5 sen (1½*d.*) would be *too* much?" On another occasion, when planning an ascent of another peak hitherto unclimbed by any foreigner, I found there was no inn within two days' journey of the mountain. The nearest house was that of the *soncho*, i.e. headman of the district. To my astonishment, when I arrived there at the close of a summer afternoon, it turned out to be a country villa worthy of the suburbs of Tokyo. Though I was a perfect stranger to him, the *soncho* received me most cordially. With many apologies for (as the Japanese conventional phrase puts it) "the disgustingly filthy accommodation," he placed a lovely pair of guest-rooms at my disposal. As we sat on the verandah overlooking the garden, discussing cakes and tea, I told him my plans, to which he listened with the politest attention. Then an attendant produced the tobacco tray, liliputian pipes were lighted, hunters were sent for to act as my guides, and everything was done to further my wishes. The next morning an additional surprise was in store. The son of the *soncho* himself volunteered to share my expedition, which ultimately was brought to a successful issue on the third day. Evening drew on as we approached the house on our return. To my surprise, the young man suddenly left me without a word, and hurried on in advance into the family quarters. For a while I felt decidedly uncomfortable, thinking I had unconsciously offended him. By-and-by, however, a domestic approached, and begged me to "honourably condescend to enter into the honourable hot bath." I then realized my friend's haste had simply been owing to his desire to show hospitality by having my bath ready on my arrival. It was a little bit of spontaneous kindness which showed that getting into hot water is not always a proof that one has "put one's foot in it" with one's friends. The following day we said our *sayonara*, and reluctantly turned away, with the reiterated "Please honourably deign to come back again," still ringing in our ears, and mingling with the regrets of a sweet-voiced childish farewell. One could not but feel how well deserved the title

still is by which this kindly people once delighted to call their country *Kunshi no koku*, "the land of gentlemen."

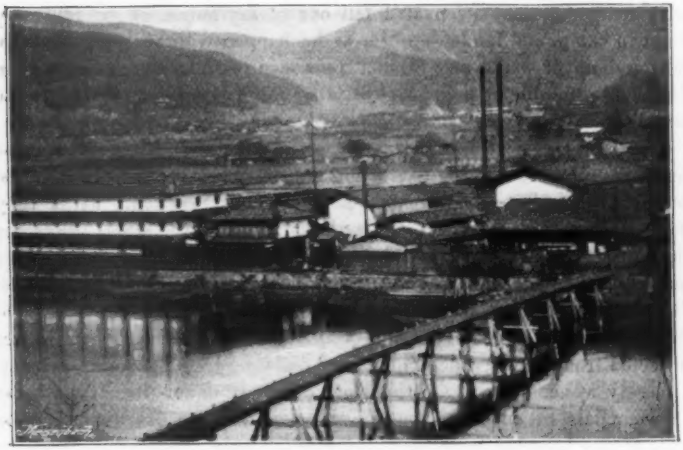
The kindness of the civilians is almost matched by the politeness of the officials with whom one occasionally has to deal. A memorable instance of this was afforded by a country policeman I met last summer in the north part of the range. Not only did he get all the information for me he could from the peasants in the neighbourhood about a peak, not yet visited by foreigners, which I wanted to ascend, but he even volunteered to accompany me on my climb. For four delightful days he proved a cheery companion. He was only 5 feet high, but his dignity was very great and commanded respect wherever we went; even to the summit of our mountain he insisted on wearing his two-handed sword and dirty white cotton gloves. He was always imperturbably good tempered, and even if I fell out of my hammock in my sleep when in camp, and landed on him as he happened to be lying beneath, he would never make any further reference to the inconvenience than to offer the humble apology, "*O jama wo itashimashita*" ("I am sorry to have been in your way").

Amongst the most interesting classes of people dwelling in or near the mountains are the hunters of big game. They are sturdy fellows, inured to hardship and capable of tremendous exertion. It is they alone who know anything of the wild valleys and the great peaks, for there they roam when chasing the bear, the boar, or the chamois in their haunts, and it is from amongst them I have always got my guides. Their garments consist of short tunic and tight knickerbockers of blue homespun hempen cloth of a very tough character. The legs are protected from thorns, tree-stumps, and snow by leggings of raw hemp or closely woven straw. On the feet, in the summer-time, they wear straw sandals called *waraji*, but in the winter these are discarded for boots of raw bearskin with the hairy side inwards. When chasing game over soft snow, the hunter fastens circular snowshoes under his boots. Should the snow be hard, he uses *crampons* called *kana-kanjiki*. These consist of metal crosses with the ends turned down and sharpened into spikes. For additional warmth, a chamois-skin is thrown over the shoulders. His weapons include an old-fashioned muzzle-loader, a spear, and a heavy knife. Occasionally, for hand-to-hand fighting with bears, he carries a double-handed sword with a point as sharp as a needle and an edge as keen as a razor. The frame used for carrying loads on the back is almost identically the same as that used by porters in the Swiss Alps and elsewhere.

During the summer months the one occupation which absorbs the attention of the majority of people dwelling in the plains that skirt the range on either hand is the culture of the silkworm. The plateau of Shinshū, on the east side of the Japanese Alps, is the chief silk-producing district in Japan. There is very little cattle to tend, as pasture land

does not exist; but the mulberry tree is grown all over these regions, and in the hottest weeks of summer the silkworms require constant attention, so voracious are their appetites. It is then often difficult to get porters for one's expeditions, even at high prices, as I have constantly been told that all the men's time was fully taken up with feeding the *o ko sama* ("the honourable Mr. Baby"), as the silkworm is sometimes fancifully called. The growing number of silk filatures in the towns and villages everywhere witnesses to the increasing proportions of this great industry.

It may not be generally known that the Japanese Government have established a number of fully equipped meteorological stations all over the empire, which issue valuable reports daily. The country folk,

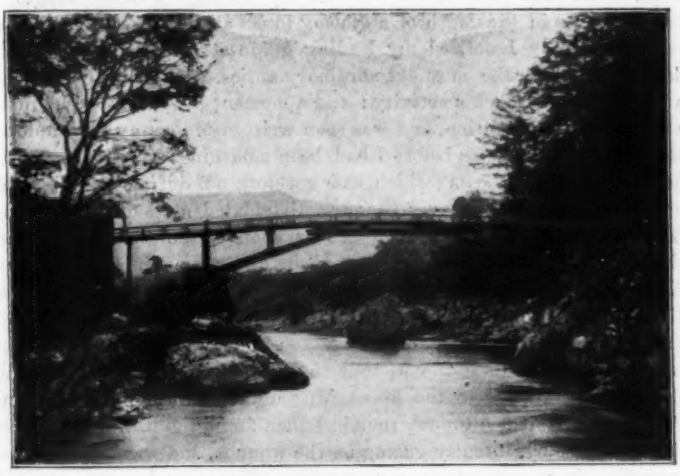


SILK FILATURES ON THE TENRYUGAWA.

however, are without these helps, and depend upon their own observations for weather forecasts. Some of them, as the results of long experience, are distinctly interesting. For instance, amongst the signs of clear weather are the following circumstances: When a dog comes out of his usual shelter to sleep in an exposed place; when an echo is heard to the pigeon's coo; when the *tombi* (kite) cries in the evening; when the charred soot on the wick of the *andon* (native paper lamp) is red; when the rainbow spans the east. Signs of rain are seen: when the earth-worm crawls out of the earth; when the cocks go to roost earlier than usual; when the moon looks low; and when the crow (the Japanese bird of love) washes himself in the water, you may confidently count on rain the very next day. Signs of approaching wind are: when the stars seem to waver in their places; when ravens

croak together in unusually large numbers; and when the murmur of the river is unusually loud.

Most interesting of all are the curious superstitions which still linger, to an extent quite unsuspected by the average traveller in Japan, among the simple-minded rustics, who as yet have scarcely even heard of such a thing as Western civilization. It all reminds me of a curious Daibutsu, *i.e.* colossal image of Buddha, which stands, or rather sits, in the precincts of an ancient temple near my former Japanese home. The image was erected some five or six years ago, and is of the usual conventional type familiar throughout Japan—with one exception. In the middle of the forehead the artist has placed a jet of electric light! This extraordinary combination of ancient and modern



HASHIDO, BRIDGE OVER ONTAKEGAWA.

is a parable of Japan to-day. In the crowded capital and treaty ports you will find modern innovations on every hand—telephones, electric lights, miniature reproductions of our British navy, or of the military system of our Teutonic neighbours, and what not. But come with me far away into the shadows of the great mountains, and hold intercourse with the simple, kindly, superstitious rustics who dwell there, and you will realize your intellectual surroundings are those of the ninth century rather than of the nineteenth.

Some incidents drawn from my own personal experience may serve to illustrate my meaning. For three successive years I visited Gamada, the remotest village in the centre of the Japanese Alps, in order to get guides for the ascent of a beautiful peak, Kasadake, that towers up above the adjoining valley. Each time I was put off with a trifling

excuse; and not until I left for good, and finally applied to the chieftain of a band of hunters inhabiting some huts higher up the valley, did I learn the real reason or get the assistance I sought. The villagers of Gamada, the chieftain explained, believe that far up the mountain wild cliffs form the home of a great spirit. Should the villagers be so wicked as to allow a Western intruder to defile the sacred precincts of the peak with his alien feet, the punishment will be the immediate destruction of their fields and gardens by sudden and violent storms.

On another peak in the same part of the range a curious experience befell me, which may illustrate this same superstition still further. I was just returning from the ascent, the first by a foreign traveller, of Hodakayama, the loftiest and grandest granite peak in the Japanese Alps. The last part of the descent lay through a dense tangle of bamboo grass in the depth of a gloomy forest at the base of the mountain. Suddenly I noticed my leading guide stop dead, and begin to dance about with the most extraordinary antics. He had stepped upon a wasp's nest, hence his activity; and a moment later I also came in for a share of their attention, and was soon writhing in agony from a dozen stings. A few minutes before I had been mourning over the loss of the heel of one of my boots (which had got torn off during the rough ten hours' climb), and also over the now dilapidated state of my clothing. So the occurrence formed an apt illustration of the Japanese proverb that corresponds to our own, that "troubles never come singly," for it runs *Naku tsura wo hachi ga sasu*, "It is the weeping face that the wasp stings." Later on in the evening, I was drying my things at the camp fire in a hut at the base of the mountain, when one of my Japanese companions came and asked to see the wounds the wasps had inflicted. Pointing them out, I turned to the fire again and continued my operations. Presently I happened to look round; I then found the man squatting on the floor close by, intently gazing on the wounds, and waving his hands over them in a series of mesmeric passes. This over, he arose, went to the door of the hut, and turned his face to the great mountain that now rose stately and solemn in the light of an oriental moon. Clapping his hands to attract the attention of the god, and bowing his head in the attitude of prayer, he made his petition to the spirit of the mountain, on my behalf. Finally he clapped his hands again to show the god he had finished with him, returned to me at the fireside, and in a solemn voice said, "This is what we call *majinai* (i.e. exorcism); you will be all right in the morning." His meaning was that I, as a foreigner, had offended the god of the mountain by trespassing on his sacred domain, and what looked to me and felt like wasps were really spirits of vengeance sent to punish me. My friend Nakazawa, however, possessing the power of exorcism, knew how to counteract their baneful influences, hence the extraordinary pantomime in which I had involuntarily played such an important part.

The frequent droughts to which these regions are subject in the summer months have given rise to a curious custom known as *amagoi*, or "praying for rain." Though it is also known in other parts of Japan, its most interesting forms are to be found here. On the east side of the range the practice is as follows: A party of hardy hunters, usually five or six in number, are sent as a deputation to the god supposed to dwell on the summit of Jonendake, one of the most imposing peaks in the whole chain. Armed with guns and primed with *saké* (rice beer), they climb to the top of the mountain and proceed to kindle a fire. By discharging their guns, rolling masses of rock down the cliffs, and otherwise making a din, they endeavour to attract the attention of the spirit

SHRINE ON SUMMIT OF ONTAKE, 10,000 FEET.

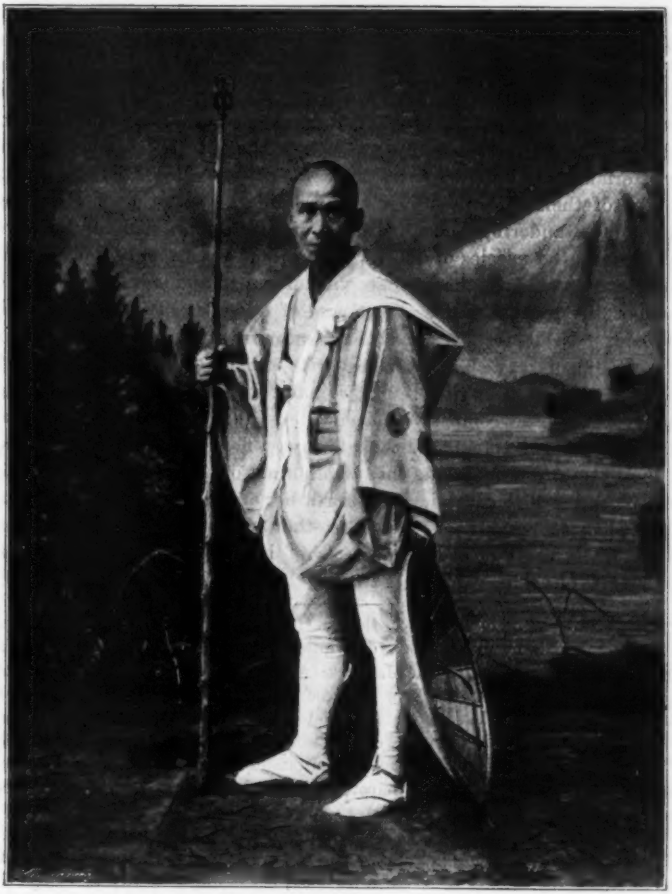
of the place to their prayers. By the noise and the flames they intend a mimic representation of the storm they are seeking, and the practice may be classed with those commonly known to folk-lorists as "sympathetic magic." The hunters who told me of the custom when I was myself on the summit, assured me that rain always comes within a few days after the ceremony. In another district, a party of villagers go in solemn procession to the bed of a mountain stream. They are headed by a priest, who leads a black dog destined for sacrifice. Arrived at the selected spot, the dog is tethered to a stone, and forthwith becomes the universal target for the bullets, arrows, and other missiles discharged by the assembled throng. As soon as the poor beast's life-blood is seen to stain the rocks, the peasants throw down their weapons and lift up their voices in

supplication to the *genius loci*, begging him to behold this defilement of his sacred precincts and to cleanse it in an immediate downpour of rain. In olden times it was the custom to use a horse, instead of a dog, as the offering. If rain was sought for, the colour of the animal must always be black, typical of the appearance of the rain-clouds desired. If fine weather was needed, the sacrifice must be one of spotless white.

As a rule, these great mountains, into whose wild fastnesses so few ever penetrate, seem to chiefly inspire people with dread. Sometimes, however, they are thought of with pleasure, and are approached in confidence and hope. For instance, to dream of far-famed Fujisan when adorned with her wintry robes of snow is the happiest of omens, especially if the vision includes two cranes and three egg-plants.

On Ontake, "the August peak," the southernmost giant of the Japanese Alps, a ceremony as weird as it is uncommon is annually practised by bands of a certain class of ascetic pilgrims called *gyōja*. As it is a fast-dying-out survival of a curious far Eastern representation of the Delphic Oracle, I will briefly describe it just as I have witnessed it on several occasions on the mountain, and also, by special invitation, at a private ceremony in one of the large inland towns. Its name is *kami-oroshi*, or "bringing down the gods," and it is practised by a number of pilgrims, from two or three to a dozen or so, under the guidance of a leader called the *sendachi*. Clothed in white garments, indicative of the purity of heart they desire, they ascend to the mountain-top. Here they believe there dwell beneficent spirits, who are ready, if approached with due fasting and sincerity of heart, to hear and to grant the petitions of the needy. The *sendachi* seats himself on the ground facing the rest, who are also seated in Indian file. The person next in front of the *sendachi* is called *nakaza*, or "medium," for it is he who acts as the channel of communication between the pilgrims and the spirits they desire to interview. The medium then takes between the palms of his outstretched hands a *gohei*. This is a stick of plain white wood with cut paper hanging from the top, and it is supposed, in Shinto temples, where it is always seen, to serve as a sort of seat for the presiding spirit of the place. With the *gohei* tightly held in his grasp, amidst the prayers and incantations of the pilgrim band, the medium throws himself into a sort of trance. His face turns a livid hue, his limbs grow stiff and rigid in catalepsy, but how it is done, only the initiated, like himself, really understand. Whilst in this state he is supposed to have lost his own personality, which is replaced by that of some god or other that has come to answer the questions of the worshippers. These are put by the *sendachi*, who acts as a master of ceremonies, and replies are given with orthodox oracular vagueness. Sometimes information is wanted about absent friends, future business prospects, the best means of curing a sickness, or the state of the weather for the next few days. When all

have been duly answered by the medium, in an unnaturally hollow voice, the *gohei* stick is suddenly jerked up in the air. This means that the god has now ascended, and that the *séance* is over. Prayers are again offered, with thanksgiving for the interview vouchsafed, and then



MOUNTAIN PILGRIM.

nothing remains but to pound the body and to knead the limbs of the medium till they resume their normal flexibility.

This curious practice, until the year I first visited the mountain, had never been witnessed by foreign travellers, and its existence seems never to have been suspected. Investigations prove it to be nothing

less than a strange survival of one of those forms of Hindu mysticism practised by the sect called the Yogacarya, which, after first finding their way into China, were introduced into Japan early in the ninth century. This was chiefly through the agency of Kobo Daishi or Kukai, the founder of the Shingon sect of Buddhists in Japan. Owing partly to the Government prohibitions, and to the spread of education and general enlightenment, these strange customs are dying a natural death, and will soon become buried in oblivion.

And so we bid farewell to the Alps of Japan. They do not, it is true, display the glories of glacier-shrouded peaks, and the scale on which they are built is only two-thirds that of the famous Alps of Switzerland. But the picturesqueness of their valleys and the magnificence of their forests surpass anything of the sort that I have seen in Alpine wanderings in Europe. Nor are their quiet solitudes yet invaded by the species of tourist with whom we are only too familiar, who rarely fails by his coarse vandalism to defile in one way or another the sanctuaries of nature, and of whom it may only too truly be said, "Nihil tetigit quod non contaminavit." And at least the Alps of Japan may claim to share with other scenes the enthusiastic eulogies of a great writer: "How many deep sources of delight are gathered into the compass of their glens and vales, and how, down to the most secret cluster of their far-away flowers, and the idlest leap of their straying streamlets, the whole heart of Nature seems thirsting to give, and still to give, shedding forth her everlasting beneficence with a profusion so patient, so passionate, that our utmost observance and thankfulness are but, at last, neglects of her nobleness, and apathy to her love!" (Ruskin, 'Modern Painters,' Book IV.).

Before the reading of the paper, the PRESIDENT said: We are assembled here this evening to hear Mr. Weston's description of that great range of mountains which Europeans have called the Japanese Alps. We had accounts, many years ago, of the provinces on either side of these mountains. Mr. Adams described to us the silk districts on the eastern side, and Mr. Troup communicated an account of his journey along the provinces on the western side, on the shores of the Sea of Japan, but we have never yet had a description of the mountain range itself. I therefore think that we may anticipate a geographical treat this evening from the account which Mr. Weston will give us of that range.

After the reading of the paper, the following discussion took place:—

The PRESIDENT: I think we have with us this evening one of the earliest travellers, I think the earliest English traveller, in the Japanese Alps. I hope Mr. Gowland will address the meeting.

Mr. W. GOWLAND: I have listened with very great interest to the excellent paper of my friend Mr. Weston. It is now twenty-two years ago since I first began to explore this range, about which he has told us so much, and, from my knowledge of the range itself, can fully confirm the accuracy of all his observations. I am extremely pleased to find that so experienced a mountaineer as Mr. Weston has taken up the exploration of these magnificent mountains, and carried it forward so very successfully. I am afraid, after his paper, anything I may say will fall rather

flat, because the few remarks I am going to make consist of somewhat dry details, relating more particularly to the minerals, plants, and industries of the range.

In 1873, in conjunction with my then colleague, Edward Dillon, I started to explore the southern part of the range; but that year we were only able to make the ascent of Ontake. Two years later, going to the northern end, we ascended Tateyama, and, nearly following the route Mr. Weston described, we ascended Yakeyama, a very interesting volcano 7600 feet high, and passed down the western side of the range. In subsequent years, from time to time, I made the ascent of several peaks, notably Yarigadake, Jiidake, Gorokudake, and Norikura, none of which had been previously ascended. I saw the peaks Mr. Weston described, and am very glad to find he has conquered them. In fact, there are very few high peaks averaging 10,000 feet which either he or I have not ascended. Now, to the geologist, the mineralogist, and the botanist, the range has very great interest indeed. Mr. Weston has described briefly its geological features, and I think about that I must not say more, but undoubtedly the range is of very ancient date; doubtless it dates from Palæozoic times, and then consisted chiefly of granite and crystalline schists. Since that time, the cones of Norikura, Ontake, Tateyama, and several others have been formed. Still there are some old granite peaks remaining, not so high as the later volcanic peaks, but still between 8000 and 9000 feet. I may say that the oldest peak is, I think, Yarigatake, which consists of very hard ancient porphyry breccia. The youngest peaks lie at the north-east, and consist of three very fine volcanoes of a very much later date than any others.

For the mineralogist there are many interesting places, especially in the neighbourhood of Tateyama. Near the base of Tateyama there have been very extensive beds of limestone. These, by metamorphic action, have been converted into highly crystalline marble; and in this there is a remarkable combination of minerals,* which, I think, does not exist anywhere else, except in one other part of the range, and at Ishiyama, at the south-eastern extremity of Lake Biwa. There are several other parts of the range where we find garnets and many other minerals I need not name. Its chief value is on account of the ores found in it. I have made a special exploration of the ore-bearing districts, and from Mr. Weston's paper, I find there is a mine which must have been very much developed since I visited it. When I was there there were only four men working at the place. On the west side of the range, near a place called Funatsu, we have very extensive and valuable ore deposits of argentiferous galena and copper pyrites, and several mines, in one of which, fifteen years ago, I found no less than 750 men working, and the annual product during 1890 amounted to 140 tons of copper, 170 tons of lead, £18,500 worth of silver from all the mines in the district. Further, we find extensive deposits of plumbago, of which, in 1890, 4500 tons were extracted. Passing northwards, we have manganese. Then, going round to the eastern side, we have deposits of silicious shale, very rich in petroleum, but they do not yield so much as they ought to do if worked by more modern processes; then, still further down the range, at Kurodake, there are extensive deposits of iron ore, but, unfortunately, in such an inaccessible position that I am afraid it will be many, many years before the Japanese can utilize them for the manufacture of iron. In order to get to them from the east side, you have to cross over the front range, varying from 5000 to 7000 feet high. Then we have, of course, sulphur on all the volcanic peaks. In the river which flows down the eastern side of the plain of Shinano, I found asbestos derived from the tributary ranges, and it is curious that in very early days this asbestos was worked, and fire-proof paper made from it. Then of the

* The minerals embedded are: graphite, wollastonite, magnesia-mica, and actinolite.

hot springs I will only mention four. Hirayu consists of hot water, the temperature being 184° Fahr. Two other famous springs (Shirahoneyu and Norikurayu) contain calcium sulphides, the temperature of the former being 128° Fahr. The solfataras of Tateyama have extremely strong mineral water, very much stronger than any other; it consists of a solution of alum, and contains free sulphuric acid. The temperature of the water is near the boiling-point.

Now with regard to the flora. This is rich, varying from sub-arctic to temperate, making it one of the finest fields for the study of Japanese botany. The plants represented are most varied owing to the range in altitude, and I shall be glad to supply a list of the most important to the Society if they care to have it. With regard to economic botany, my researches bear out what Mr. Weston has said with regard to climatic conditions. On the west the vegetation is not nearly so luxuriant as on the east. On the east, I found rice growing up to 4000 feet, ordinary potatoes to the same height, barley to about 4200 feet, buckwheat to about 5000 feet.

Besides the interesting minerals, ores, and flora, there are some very important archæological remains on the plains and the low hills on the eastern side. Towards the north-east end of the Shinano plain, there are dug up from time to time stone arrow-heads and stone axes of such a form that we must conclude that at a very early period indeed that part of the country was inhabited by the aboriginal Ainos. If we come further south in the plain, we find a most interesting series of dolmens and chambered tumuli. Near the town of Nagano, there are a great many in a ruined state; but at Matsushiro I found eight in fairly good preservation, of four of which I took measurements. They consist of rude rectangular chambers of stone, the length of which varies from 14 to 18 feet, the breadth is about 7 feet, and the height about 8 feet. Two of them are megalithic; they are constructed of very large stones, and are entered by a narrow gallery 4 feet in width, the entrance facing south within a few degrees. The remains found in them consisted of iron swords of the dolmen period, and bronze rings plated with gold, besides a considerable quantity of sepulchral pottery. Remains, absolutely the same as these, I have found in my explorations of the great dolmen districts in the centre of Japan, and they show distinctly that these dolmens are of approximate age with those of the Central Provinces; therefore not later than the fifth century, and probably much earlier, that part of the plain of Shinano was occupied by the Japanese, and not by the aborigines.

I am afraid I have exhausted my time, but I must say one word about the other mountains, which I should advise all travellers to visit. I have been in the neighbourhood of all, and have ascended some; one of the first in the north-east of Japan, Chokaisan, is one of the most beautifully formed volcanoes in the country, 6800 feet high. Further south we come to the magnificent group of mountains round Nikko. South of Shinano, we have a grand mass of mountains, round which I have been, though I have never ascended them. The peaks are quite as high, or nearly as high, as the Shinano range, and they are practically unexplored. Going still further west, we have a magnificent mountain mass in Southern Yamato and Northern Kiishu, not quite so high as the Shinano-Hida range, but for a sportsman they form a magnificent hunting-ground. The bears are numerous, and a kind of chamois (the goat-faced antelope, *Nemorhedus crispus*) and boars are so abundant that in all the valleys leading up to the mountains, wherever there are fields, there have to be stockades placed in order to prevent them from destroying the crops. Still further westward we have the very fine volcano of Daisen, which I have been round, but have not ascended. Still further, we have one or two magnificent mountain groups in Kiushu. Now, in all

these the Alpine climber will not find glaciers, and where snow-slopes are found, there is no difficulty in dealing with them; but everywhere the scenery is wild and grand, and if a spice of danger is necessary to tempt him to visit these glorious mountains, he will have no reason to complain if he attempts to scale some of their highest pinnacles, or to descend into some of their craters.

Professor MILNE: At the present moment I am being weaned from Japan, a country of gentle manners and artistic instincts; I have already experienced two or three months of the process, but when I saw Mr. Weston's pictures, I felt that the weaning had been useless. Now I am trying to find a few friends who will believe what I tell them about Japan. I believe everything Mr. Weston said, because I know it to be true. One of the things that struck me when I reached that country was the wonderful clearness of the atmosphere at certain seasons of the year. I had been brought up in a town that received the smoke from two counties. When the wind was westwards it blew from Lancashire, when it was eastwards it blew from Yorkshire. Thus it was always smoky, except perhaps once or twice a year, when we could see for about 7 miles. In Japan, however, I could see Fuji rising up 12,400 feet, at a distance of 70 miles. I was so surprised that I wrote home to my mother, "I can see mountains at a distance of 70 miles." My mother replied, "Dear John, your eyesight must have wonderfully improved." The next thing that I noticed was the beautiful form of Fuji. This so struck me that I photographed it from twenty-six points of view. The analysis of the curves showed that they were mathematically as true as circles and parabolas. The meaning of this volcanic curve is that the base of the mountain is just sufficient to support the material above it, and if you wanted to increase the height of the mountain you would have to increase the size of the base. Given the shape of the mountain, you can tell something of the nature of the material it is composed of, and this is one of the lessons which have been learned from Japanese mountains.

The material out of which Fuji is built, as determined from its shape, has a strength equal to that of ordinary brickwork. Once I slept on the top for over a week. From observations made with pendulums, it seemed that the mountain heeled over by the wind. This heeling was equal to that which would be produced by a wind pressure of 50 lbs. per square foot if a mountain like Fuji was made of brick. We also made observations with barometers, thermometers, and hygrometers, at intervals of two hours, and used this material, together with observations made at the base of the mountain, to determine its height. One result we obtained was that from the same data you will get a different height by different methods of calculation. One man levelled Fuji from the bottom to the top, making the height 12,365 feet—an easy number to remember, because there are 12 months and 365 days in a year. One conclusion I come to is, that we are not certain about the exact height of any mountain. Changes in barometrical pressure may cause mountains to vary in height. They may swing from side to side with diurnal waves; they may shiver and tremble in a tremor-storm; while at the time of an earthquake they may wag their heads and dance.

The PRESIDENT: I think we have been very fortunate this evening, both as regards the paper and the discussion. Mr. Gowland has given us a most interesting account of the metalliferous aspect of the range of mountains and of their archæology. Professor Milne, too, has supplied us with much matter for reflection. I really think that these slides are among the most beautiful we have ever seen in this room. I am told by Mr. Weston that they were nearly all executed in Japan. I do not know whether the meeting would like to see a few more, but I am sure you will all pass a very hearty vote of thanks to Mr. Weston for his most interesting paper, and for the splendid illustrations which accompanied it.

NOTES ON A JOURNEY IN TARHUNA AND GHARIAN, TRIPOLI.*

By H. S. COWPER, F.S.A.

THE Tripolitan range of hills, through which I was enabled to make a brief but highly interesting journey in March and April, 1895, is probably as little known as any piece of inhabitable country, equally close to the sea, in the whole of the Mediterranean coast of Africa; and this is rendered more remarkable by the fact that a large part of the district is full of remains of a primitive and quite uninvestigated civilization. It is, of course, the fact that many of the earlier explorers passed through these hills on their ways to the Sudan; but with the exception of Barth, who made a journey through them from end to end, they all appear to have passed quickly through them by the caravan routes, without diverging to examine what is probably, from an archæological point of view, one of the most interesting portions of North Africa.

The reasons for this neglect during the last decade are more obvious, for since about 1880 the Turkish authorities have placed every obstacle in the way of European travellers entering the country, and this prohibition has been rigidly enforced. I trust, therefore, that a brief account of my ride will not be altogether unacceptable. My objects being purely archæological, I resolved to make my way first to the Tarhuna district at the eastern end of the range, where both Barth and Von Bary had noticed briefly the existence of a few megalithic structures, and accordingly I engaged a guide who was a native of that locality.

I left Tripoli on March 21, and followed a south-easterly course, through the palm groves which fringe the coast, until we passed south of Tajura, where the plain is studded with lime-burning kilns (called *kushi*), the heavy black smoke from which can be seen for miles across the plain. The road then led past a small grove of palms with the tomb of Merabut Si Abd el Karim, and out on to a plain, where we camped.

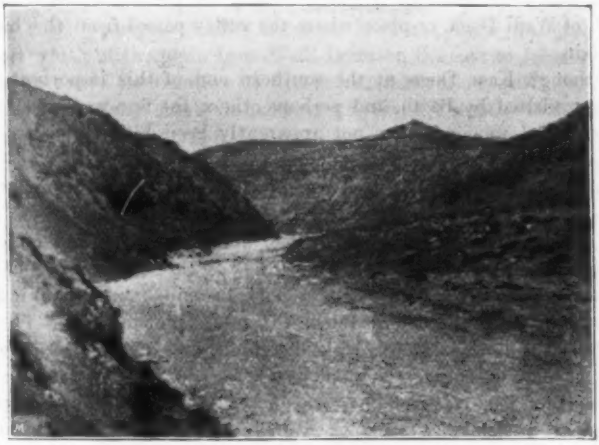
The country between the coast and the hills is thus divided: (1) the palm groves on the coast; (2) a strip of partly cultivated plain; (3) a strip of sandy desert of varying width; (4) the lower slopes of Tarhuna, consisting of gently rising, undulating country, averaging about 550 feet above sea-level; (5) the Tarhuna hills.

The desert strip consists of wave-like ridges of blown sand, so light and dusty that the crossing of it in a hot gibleh wind is by no means pleasant. Here and there the sand is blown clear and discloses a hard surface, often covered with shreds of pottery, mostly Roman, and rudely worked flints. These ancient sites are numerous.

The most important feature on this part of the road is the Wadi

* Map, p. 228.

Raml, which I struck about noon on the second day. This watercourse, about 300 yards wide, runs here north-east through the desert of shifting sand, and at this time of year still contained a rill of running



THE WATERCOURSE OF WADI DOGA, NEAR KASR FASGHA, LOOKING NORTH-WEST.

water. At the point I struck it, it is met by the Wadi Saghia, coming from the hills further east.

WADI DOGA NEAR KASR DOGA, LOOKING NORTH.

The lower slope of Tarhuna, where I camped on the second night, is of varying character, planted with corn in patches, and covered in other places with scrub and *deese* grass. Here and there are great

yellow blotches in the landscape, which are blown sand, on which nothing will grow. The Tarhuna hills rise on the south side like a wall, showing but few prominent elevations.

On the third morning I entered early by the Fum Doga, *i.e.* the mouth of Wadi Doga, or place where the valley passes from the hills to the plain.

Although Kasr Doga, at the southern end of this important wadi, has been visited by Barth, and perhaps others, the fine wadi itself, with its wonderful remains, have not apparently been hitherto visited by a European.

Passing through Fum Doga, we entered the wadi and wound up on to a beautiful plateau, green and with a good deal of cultivation. This plain varies between 700 and 900 feet above sea-level, and on either side rise hills varying from about 1000 feet at the mouth to about 1700 feet near the head of the valley. The principal ones, flanking the valley at its entrance, being Jebel Ahmar and Jebel Areif. Through the plateau runs the watercourse—a ravine averaging about 150 feet in depth, of tortuous course and stony bed.

The chief part of the day was spent examining and photographing the numerous ancient sites in the valley. In every direction could be seen great standing trilithons, ruined or complete, single or in rows. Lines of massive walling enclosing square areas, great altar stones, Roman capitals, cemented baths, and ruined structures were to be found on almost every hillock rising from the valley.*

Night compelled me to reach Kasr Doga at the head of the valley by a short cut over Jebel Arva, instead of by the tortuous course of the wadi. The ascent was very steep and rough, and hard for camels. On reaching the summit, I found we were about 1750 feet above sea-level, and nearly 1000 above the valley we had left. It was, however, too dark to see but faintly the wave-like crests of the surrounding hills, and the Wadi Guman, which stretched away from our feet towards the sea, and the district called Targut. On the top we found ourselves on another plain, with fields and fenced gardens and a few figs. In some of the rougher places the air was sweet with wild thyme and other sweet-smelling plants. The descent to Kasr Doga was less steep, and we encamped under the great Roman tomb mentioned by Barth.

To the south-east of Kasr Doga, which is the head of Wadi Doga, spreads an undulating plain of great extent, which I shall call the Tarhuna plateau. Here I spent two days, camping with the family of my guide, and examining the senams or megalithic temples, the ruins of which are to be found on every point. The plateau averages about 1250 feet above the sea-level, and is therefore lower by some 500 or 600 feet than many of the hills on its north side, through which are cut

* The inhabitants of all this part of Doga are called M'Saaba.

Wadi Doga and other wadis. The most important of these appear to be Wadi el Menshi on the north-east, and Wadi Daun and the Kseia on the east. To the south-east and south the plateau bears the name of Ferjana (though it is still in Tarhuna), and appears to shelve away into broken country, beyond which are Beni Ulid and Wadi Sufejin. The greatest width of the plain from Wadi Daun on the east to Jebel Jumma on the west near the Gharian district is about 25 miles.

The Tarhunis or Arabs inhabiting the district appear to be a race of pure-bred Arabs. In fact, I saw no traces of negro blood among the people in these hills. They are all tent-dwellers, or troglodytes, and,

SENAM AT KOM ES LAS, TARHUNA.

with the exception of the one or two points where a small Turkish garrison is maintained, there is not a built house in the district. None of the Tarhunis are, however, nomads, but they are divided into tribes, and the chief feature is the patriarchal system of living together by families. Thus my guide, one of a race of merabuts or saints, and the head of his family, lived with his brothers and sons and their respective families all in one line of tents. These are, however, only their winter quarters, and in the hot weather they go into tiny huts built of wattle-work, which are dotted about independently among the crops. At every encampment there are a number of ferocious dogs, which render it really

dangerous for the stranger to venture from his tent at night. These animals lie round the camp, and savagely attack every one who approaches, even an inhabitant of the camp, who would certainly be badly bitten if he did not carry and use a heavy stick. The Tarhunis are handsome, tall people, and all wear the white barracan or kholi, which is common in all Tripoli. Every man carries a long flint-lock gun, without which he never moves ten yards, although it is seldom used. Pistols are sometimes worn, but the sword is not seen.

In the camp a certain amount of order and cleanliness is always maintained. In that of my guide, a Mueddin chanted the call to prayer as regularly as is done in the town. The Tarhunis, indeed, seem punctilious as regards the forms of their faith, and many are regular observers of the hours of prayer. It was Ramadan when I was travelling, and, although the faithful are exempted from observing the fast when on a journey, nothing would induce my men to touch food between sunrise and sunset. They did not consider a fortnight's excursion in their own country a journey.

The Tarhunis, unlike many nomadic tent-dwelling Arabs, rigidly hide their women from view, and I never saw, during my ride, any woman (except one very ancient dame) nearer than about 300 yards.

The underground houses are a few chambers dug out below the level of the field in the earth. Some are inhabited all the year round, but others are only resorted to in very hot weather.

The food of the Tarhuni is chiefly bazine and cuscus, both made of flour, the latter often very nice, and the former very nasty. Bread is but little baked, and what there is is unpalatable.

The occupation of the Tarhuni is agriculture and stock-raising. On the plain are pretty little fenced enclosures called henshirs, in which are grown wheat, barley, and a few figs. The flocks are cattle, sheep, and camels; horses are not common. Trees are almost unknown, and a solitary "batum" of magnificent dimensions is known as El Khadra, "the green," and is commonly named as the only tree in Tarhuna. There are, however, some in the hills on the west near Gharian.

For water the people are dependent on the winter rains and the supply thus formed in the deep wells scattered over the plain. It is manifest that in former days the country maintained a large and industrious population, so that a great change in climate, and consequently in water-supply, has at some date taken place.

Though living within a few days of the coast, the Tarhuni knows little or nothing of European civilization, and their curiosity and amazement at such things as a pocket-knife with several blades, a compass, or a camera tripod was very amusing. On showing a party of them the reflection of a large trilithon in the finder of my camera, I was asked whether the image seen was the structure before us or one I had taken the day before.

In Tarhuna there is one mosque, Jamah Sheikh al Madeni, where probably they bury some of their dead, although I cannot be certain of this, as I did not get an opportunity to visit it. Often, however, they bury on the billtops near their tents, and many of the tombs of the merabuts are nothing more than rude cairns or circles of stones.

After spending two days riding from ruin to ruin, photographing, sketching, and measuring, I marched south-east to Kasr Zuguseh, in the Ferjana plain, where, in the walls of a small stronghold, I discovered some sculptures of Phallic subjects, accompanied by a Roman inscription. Four watercourses were passed on this day before arriving at

KASR ZUGUSEH (FERJANA DISTRICT), WITH CARVED STONE.

Zuguseh, namely, Wadis al Menshi, el War, el Uftah, and Hallak Shakir. Pitching my tent, I at once rode off to the south-east, where I found the ancient sites certainly better preserved than in the more northern part of the plain, and equally numerous. In fact, wherever one looked across the plain one's eye met, either near or far, a standing senam or the upright posts of one capping the hills.

It had now become evident that it was impossible to visit anything like all the sites, and it would be more useful to ascertain, if possible, the geographical limits east and west. Accordingly, on the morning of the 27th, after a wet and squally night, I turned north-east and directed

my steps towards Jebel Msid and the Wadi Kseia, where Barth had noticed already some remains. Leaving the plain, we passed down a narrow and stony but picturesque wadi called Shaahbet el Khel, crossed at frequent intervals by massive Roman walls, evidently used for damming the water. This runs into the wide and more important Wadi Daun (called by Barth Dawan), which runs east and west, considerably below the level of the Tarhuna plateau. On the north side, and nearly opposite Shaahbet el Khel, is another tributary wadi called Kurmet al Hatheia, which runs north-east and comes out into the Kseia plain.

Like Shaahbet el Khel, both Wadi Daun and Kurmet el Hatheia have the Roman dam-like walls built across them at frequent intervals, those in Daun being continued to the west until the wadi loses itself on the plain. Besides these, in the wider part of Daun, which is between a quarter and half a mile across, there is the ancient fortress called Kasr Daun, situated on the left bank of the stream, and innumerable relics of Roman and perhaps earlier date.

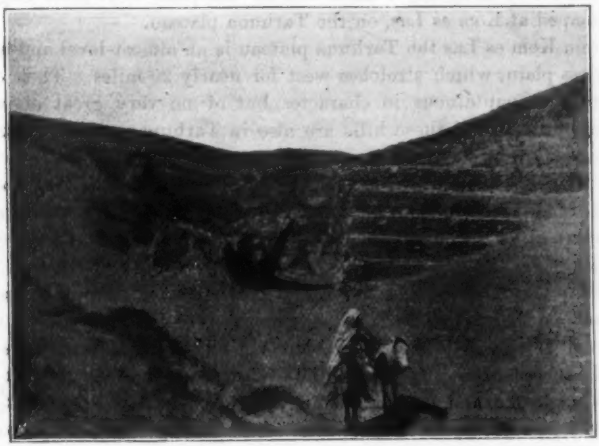
Leaving Daun, we entered Kurmet el Hatheia, and about a mile's ride brought us out into the beautiful valley called Kseia. Here the scenery varied much from the barren plateau, the hills round it giving a more sheltered and homelike appearance, which was added to by an occasional tree. Away to the north-east, at the end of the valley, stood out Jebel Msid, easily recognizable by its rounded form and the small ruined building which caps its summit. In the middle of the valley I found the trilithon engraved by Barth in his book of travels. Others, some of them very remarkable, exist due south from here, and also at the base of Jebel Msid.

On arriving at the foot of the mountain, I saw a crowd of women standing before a line of tents, and uttering the strange mournful cry for the dead. A man had died some time before, but the ceremony had been postponed till the end of Ramadan. The valley at the foot of Msid I found to be about 800 feet above the sea, and the summit of Msid about 1450 feet, and therefore lower than some of the points about Doga.

From the summit a magnificent view lay before us. To the north-east lay Kusabat, appearing like three villages set in palm groves, and distant about 7 miles. This was the only glimpse I got of anything like a village while I was in the hills, for I did not approach the one or two places where soldiers were quartered. Between Msid and Kusabat lay Wadi Uani, which joins Wadi Kseia south of Msid, and they run together to Targelat. Strange to say, neither of these important wadis appear on any map I know. In all other directions nothing but range after range of low hills, all of similar elevation, except to the south, where they died out in lower ranges towards the Beni Ulid country—a view somewhat monotonous, but charming from its sense of air and freedom, and in some ways from its utter desolation.

Kasr Msid, the ruined building on the top, appears to have been a

small Muslim monastery, or something of the sort, for beneath the building is a tiny vaulted mosque. In this building, which is now disused, there is some curious plaster decoration on the roof close to



ROMAN WALL (DAM?) IN WADI DAUN.

the "mihrab," amongst which is a human hand in relief—a curious subject for a Mohammedan mosque.

SENAM BU MATIRAH IN WADI KSEIA.

Having examined the senams of Kseia, and my men informing me that there were but few, if any, others further east, I decided to march

straight to the western end of Tarhuna, and then, by returning to Tripoli through Gharian, I hoped to ascertain if the series extended in that direction. Accordingly on the 28th I returned by Wadi Daun, which I followed up till I came out on the plain near Kasr Zuguseh, and camped at Kom es Las, on the Tarhuna plateau.

From Kom es Las the Tarhuna plateau is an almost level and nearly waterless plain, which stretches west for nearly 20 miles. Then comes a country mountainous in character, but of no very great elevation. The eastern part of these hills are also in Tarhuna, and then Gharian is reached.

A nine hours' weary journey in a hot gibleh wind, without a well on the road, brought us to the base of the hills. The aneroid showed that the plain descends about 100 feet from Kom es Las to its western extremity.

The remaining days of my ride were neither so profitable nor so pleasant as the earlier part. The senams were few and far between, and from March 29 to April 2 it blew a gibleh wind of such force that we all suffered exceedingly. On the first day a camel-man fell out with slight sunstroke, and on the ensuing days the heat was so great that the films in my camera warped and the machinery stuck, my books and maps curled up with the dry heat, and sticks of sealing-wax in my baggage became flat like cardboard. The air was charged with electricity, so that every time I moved the wool of my white burnus crackled distinctly. Sleep at night was impossible, for the wind threatened every minute to blow down the tents.

We entered the western Tarhuna hills by a picturesque pass between Jebel Jumma and Ras el Aswad, which appear to be about 300 feet above the pass-level, and therefore about 1900 feet above the sea. Here we entered on a country of a totally new character to all we had seen—a broken hilly district intersected by frequent wadis and watercourses running north and south. First we struck Wadi Hammam, a watercourse behind Jebel Jumma, with stagnant pools of water. Then we came to a lesser ravine, Shaahbet al Zeraghwanieh, where some small batum trees formed a most welcome shelter. After that we camped at Wadi Wif, a beautiful fertile valley with a few batum trees and patches of corn lying in the heart of the desolate hills, but not a tent in sight.

Immediately west of Wadi Wif is the boundary between the districts of Tarhuna and Gharian, the most important place in the last being Kasr Gharian, where a Turkish military post of some strength is always maintained. Gharian (at any rate the eastern part of it, which I traversed) is very different in character from Tarhuna, being more truly mountainous, and, I should say, less thickly populated. The Gharianis, like the Tarhunis, live in tents (gitûn) and underground dwellings, and have the reputation of being richer than the Tarhunis, who, for some hardly explainable reason, are considered the poorest and

unluckiest of the hill-men of the Tripoli chain. As long as I was in Tarhuna I experienced nothing but courtesy and hospitality from the people, which was doubtless due to my travelling with a Tarhuni of a respected and even holy family; but as soon as I entered Gharian

SENAM EL MEGAGERAH, WESTERN TARHUNA.

things changed. My retainers insisted on my bundling myself up in burnus and tarbush whenever we approached tents, and the inhospitable character of the natives was shown at Wadi el Ghan, where the people refused to sell us either provender for our cattle or food for ourselves.

JEBEL JUMMA.

My route from Wadi Wif lay west and north-west through the hills of Gharian. The chief features in this part of Gharian are the wide and important wadis intersecting the hills and running north towards

the sea, and the range of hills lying west of Wadi Wif called Kushiteh Gamatah. The most important wadis are Wadi Bir el War, a large stony watercourse, dry at this time of year; Wadi Gethathet Dum, a little beyond which is another, the name of which I failed to obtain; and, lastly, Wadi el Ghan, eight hours distant from Wadi Wif, where, to my delight, we found a stream of running water. This wadi at this point is some four or five hours from the Kasr, and is, in fact, the southern prolongation of the great Wadi Haera or el Jair, which runs right out on to the plain some 8 or 10 miles west of Wadi Mejenin.

Arabs, like animals, have an extraordinary objection to running water, and search for a stagnant pool of putrid water rather than drink of a flowing stream; and here I had my only altercation with my retainers, who objected to camp at Wadi el Ghan on the score of unwholesome water, and the plea that the place was on the high-road to Gharian, and infested with thieves.

We appeared, however, to have now got out of the district of the senams, and the intolerable heat decided me on following the wadi direct to Tripoli instead of approaching nearer to the Kasr, by which nothing could be gained, and could only run my men into possible difficulties with the authorities.

The country passed through between Wadi Wif, and Wadi el Ghan is cut up into many points, among which the traveller winds on his road to Gharian. There are no wide plains as in Tarhuna, and the track leads through the hills at an elevation of 1400 to 1600 feet, while the hilltops appear to be some 500 feet higher. Though my men could hear of no megalithic ruins of the senam type, some of the eminences are capped with crumbling buildings which may well be Roman. On the lower ground a good deal of corn is planted, and halfa grass is plentiful. Thorns (sidra) are fairly numerous.

Wadi el Ghan, through which I commenced my return journey on the afternoon of April 1, is so beautiful that I felt no regret at having climbed no further over the barren hills towards Gharian, although the scenery, indeed, was somewhat spoiled by the sickly haze which hung over all after the prolonged gibleh wind. This important wadi is, indeed, with its lower prolongation of Wadi Haera, a regular caravan route from Tripoli to this part of Gharian. First we clambered along the rocky bed of the watercourse, which for some distance was a conglomerate of large stones, but lower down becomes limestone; and in one place a fine section can be seen where the latter overlaps the former. Further down the wadi runs between grand cliffs of limestone and sandstone, which in places were dark red with iron ore. In the rough bed of the ravine were stagnant pools with reeds, but running water we found none after getting some distance from the camp. There was life, too, in this wild valley. Droves of camels came trudging along, with their dusky, lean-limbed owners nodding on their backs or slouching at

their heels. At one corner a party of wild, half-naked lads and lasses dashed screaming and laughing from some game, and, hiding behind reeds and rocks, stared with great black, wonderstruck eyes at the

SHAAHBET EL ZERAGHWANIEH.

apparition of the white skin invading their playground. Then a mile of unbroken solitude, and another corner, and before us stood by a rock

ISOLATED HILLS ON THE PLAIN NEAR MOUTH OF WADI HAIRA.

two tall white-robed Arabs like statues, with their bleating charges round them.

Three hours' ride from our camp the wadi emerges from the cliffs and becomes a watercourse running through cultivated pastures, which extend up to the bases of the hills.

From here I travelled, partly by day and partly by night, direct to Tripoli, which I reached at midday on April 3. After leaving the Gharian hills, the route lay over a green semi-cultivated plain similar to that crossed before entering Doga, but more level and of greater extent. In all we marched about eleven hours across this plain before we struck the desert patch, and by my aneroid I found that it shelved gently from about 600 feet to about 150 feet above sea-level. Our direction was generally north-north-east and north-east. The most interesting features on this plain are the three isolated hills lying on the plain like islands just outside the place we left the hills. These my men called Battus, M'dawar, and Mamureh, and insisted that the names were interchangeable, and it did not matter which was which.*

At the same point we could see the hills we had left, receding in a long continuous range till lost in the haze down towards Fum Doga. A headland which appears to project furthest of all towards Tripoli is called Kashi Maruf.

At Bir el Sbeia our route dropped into the wide and fertile Wadi Mejenin, by far the richest and best-cultivated country we had seen in Tripoli. Four hours beyond this we entered the desert patch which cuts off the capital from the rest of the country on the landward side. Here we left our camels to follow, and four hours at horse pace brought us to the gates of Tripoli.†

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* On Barth's map I find these called Bates, Smaera, and Gedaea. It should be noted that my information here was from Tarhuni men, who did not know this district very well.

† I submitted a sample of the red iron deposit of Wadi Haera to Mr. F. W. Rudler, of the museum of practical geology, who has favoured me with the following report: "The red material seems to be an ochreous clay. The colouring matter is of course red oxide of iron, in the shape of soft red hæmatite or 'reddle.' The material would probably form, when ground, a pigment or ochre of good colour. But to be of any economic importance it must occur in quantity."

Notes on Mr. Cowper's Map.—The map accompanying this paper, with the exception of the coast, the direct route to Kasr Beni Ulid (indicated faintly) and the positions of Kasr Doga (32° 32′ N., 13° 40′ E.) and Kussabat (32° 35′ 30″ N., 13° 58′ E.), determined by Admiral Smyth, is based upon a compass survey by the author.

In several instances bearings taken on a point from two stations proved evidently erroneous. This must be attributed to the fact that the Tarhuna hills are of very equal elevation, and without striking points, and this feature evidently misled the guide in pointing out hills by their names.

The following bearings (among others) have been utilized in plotting the survey:—

1. From a point north-west of the camp of March 22: Kasr Jafara, 69°; hill east of the mouth of Wadi Doga (J. Ahmar), 148°; Jebel Kashi Maruf, 235°.

2. From Senam Kasr Doga: Kasr or Jebel Bu Tawil, 292°; Kasr Doga, 242°; Kom es Las, 175°.

3. From Ras el Id: Bu Tawil, 308°; Ras el Doga, 328°; Kom es Las, 205°.
4. From Kom es Las: Ras el Id, 24°; Kasr Doga, 347°; Jebel Thubain, 223°.
5. From Jebel Msid: Kussabat, 51°.
6. From camp, March 29: Kom es Las, 64°; Jebel Jumma, 230°; Bu Tawil, 37°; Jebel Thubain, 188°.
7. April 2, from a point marked "600": Thaniet Bu Ghelan, 236°; Nuebat mta Ergaat, 170°.
8. April 2, from a point near J. Battus, "450": El Nuebat mta Ergaat, 182°.
9. April 3, from camp north of Bir Sbeia: mouth ("Fum") of Wadi Doga, 103°; Kashi Maruf, 123°; Thaniet Bu Ghelan, 211°.

The altitudes inserted are from aneroid readings.

JOURNEYS IN PERSIA (1890–91).*

By Captain H. B. VAUGHAN, 7th Bengal Infantry.

We found the Kal-Mura river full of water, and flowing rapidly into the salt desert close by. It was crossed with some little difficulty, but as we had camels with us, we transferred the mule-loads to their backs, and got them over dry.

During the next long march the baggage took one road and we took another. We found our way in the dark, but no baggage turned up until midnight, and for several hours we employed ourselves in lighting bonfires and firing shots to attract them to the spring at Serai-Bunab, the rendezvous settled upon. Shortly after this we arrived at Turut, where I found some former acquaintances. From Turut, where I picked up my former guide, we marched by a new route to Husen-Nun, and, still skirting the *kavir*, we passed a village (Paistun) on the road.

Husen-Nun is a small village within sight of the large town of Reshm, and it is here that the road across the *kavir* from Jandak first reaches *terra firma*. A few date palms grow in the place, and it is within a mile of this place, but to the west, where the Gugird range commences in a few low hills.

The road soon ran between the desert and the foot of the Kuh-i-Chashma-o-Chah-Shirin, or hill of fresh-water wells and springs; then we passed the Kuh-Didawan, where in former days a look-out was always stationed to observe and signal Turcoman raiding-parties, who were very fond of going by forced marches through these inhospitable wilds and making a sudden descent on some town, which, by reason of its distance from the frontier, imagined itself secure. Large blocks of stone, very dense and hard, and of a brilliant red and yellow, cumbered the ground, besides many others, which were found by a geologist to be impure jaspar and flesh-red gypsum. After going 36½ miles we reached a small well, the Chah-Shirin. Next day we passed through the most fantastic scenery, passing hills of vivid green and red and

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* Map, p. 124. Continued from the January number.

yellow, or sometimes found all three combined in one hill in sucessive layers. The road wound up and down, passing through gorges and under rugged cliffs of fantastic shapes, often pierced with arches and having numerous pinnacles. It all looked so extraordinary with its exaggerated colouring that it resembled a dream, and looked as if it only wanted a dragon to complete it. After going 34 miles we reached a village within sight of Samnan, a well-known town on the high-road. Here I met an old friend in whose house I had previously stayed for three weeks. I gave him a watch which wound itself up as one walked along, with which he was vastly pleased, and presented me in return with a long piece of Persian woollen material called "pushmin" and other things.

At Teheran I was sorry to part with Captain Burton, who had been my travelling companion for the past four months, and without whose valuable help it would have been impossible to have covered so much ground satisfactorily in so short a time. His road lay homewards through Europe, and mine was back to India by the Persian Gulf. At Teheran I met Mr. C. E. Biddulph, of the Indian Civil Service, and together we journeyed from Teheran to Isfahan by a route through the desert, which he has already described in a paper communicated to and published by this Society; and as his description of the journey is very much the same as what my own would be, I will content myself by referring only to those points of interest which came under my observation. After leaving Karim-Kaneh on the fourth day, the southernmost village on the north side of the desert, we crossed a small salt stream draining east, and on the *kavir*, it was about 30 yards broad, and is, I have no doubt, the same stream I crossed in 1888 to the east of the Siah-Kuh, and there called the Shut (salt-water river), which was also flowing east into the principal bed of the *kavir* lying between Reshm and Jandak. About 12 miles further on there was so much ironstone in the hills that the compass became quite unreliable, and interpolation by the plane-table was resorted to. We also saw, or imagined we saw, from the Siah-Kuh a causeway several miles in length, which was built to cross the swamp between it and Kishlak by Shah Abbas.

The next point of interest was the Daria-i-Nimak, a solid sheet of rock salt of varying, but in places doubtless immense, thickness. Its area we estimated at 440 square miles, and its elevation was 2700 feet, so that it is higher than the central desert, but does not drain into it unless covered with water to a sufficient height, and then only by a shallow watercourse a few feet broad. I crossed such a watercourse in 1888, south of the Kuh-Tulha, but as it was misty, I could not ascertain for certain whether this was the case. All I could make sure of was that there was rising ground to the west, so it is quite possible that the chain of low hills seen south of the Siah-Kuh completely divides the two deserts. A sample of this salt, tested by the chemical examiner to the

Punjab, was found to be practically pure sodium chloride, with no insoluble residue. Very small traces of sulphate were found, lime was absent, and magnesia was found only in small quantities, and it was suitable for dietetic purposes.

The following rivers are said to contribute to the adjacent salt lake, which washes the western termination of the salt:—

1. Rud-Khana-i-Kinaragird.
2. Rud-Khana-i-Zir-i-Hassanabad.

Both these are, I think, branches of the Rud-Khana-i-Shur river, and must pass north of the lake of the Hauz-i-Sultan-Kavir into the Daria-i-Nimak, if that is really their termination. This information was given me by my guide, who also said that the Kom and Pul-i-Dalak rivers also contributed to the Daria-i-Nimak, which was evidently incorrect, as they flow into the Hauz-i-Sultan-Kavir. Mr. Biddulph, who was my fellow-traveller on this occasion, and saw both the lakes on his return journey to Tehran from Kashan by the high-road, says that they are quite separate. If, however, it is true, as reported, that the waters of the Hauz-i-Sultan-Kavir are still rising, it is just possible that they may yet unite.

After crossing the salt, over which our route lay for a good 24 or 25 miles, a great number of sandhills were met with, which extend close up to Kashan, and back and again eastward to the Kuh-Yak-Ab (ice-water mountain). I had now travelled all round the Dasht-i-Kavir, and twice passed along its northern and western border, and am therefore enabled to give a fairly good idea of its general geography, of which a short summary may not be out of place.

The Dasht-i-Kavir, or Desert of the Kavir, is also known in old maps as the Great Salt Desert, but the former is the name by which it is best known amongst the Persians. It extends approximately from 51° to 57° east longitude, and from 33° 30′ to 35° 30′ north latitude. Its greatest length from west to east is about 360 miles, and its greatest breadth from north to south about 150 miles.

It is partially divided into two portions by a chain of hills connected to each other by elevated and firm soil, about longitude 52° 30′ east. This chain comprises the Siah-Kuh, Kuh-Tulha, Kuh-Safeid-Ab, and a few lesser hills. The slopes connecting them consist of smooth, rounded, glacier-like slopes of gravel soil covered with small bushes, tufts of grass, and other vegetation. Fresh water is occasionally met with, but in small quantities only.

The desert itself is a depression into which all the waters from the surrounding country drain, and either lose themselves or form lakes or morasses. Its elevation, unless in the centre, is probably nowhere less than 2000 feet above sea-level. A reference to the map, however, shows that for Persia this is a considerable depression. Take, for instance, the towns on its borders, and their heights above sea-level: Teheran is

5800, Samnan 4000,* Kashan 3200,† Anarak 4675, Jandak 3390, and Dasgirdun 2850 feet, which latter even is several hundred feet higher than any portion of the salt desert.

The greater portion of this tract consists of *kavir*, or sandy soil strongly impregnated with salt. I have no doubt in my own mind that it has been formed by the evaporation of water which once covered it, and that at first it is a smooth sheet of mud, which as it dries swells and puffs up, being pitted with holes as large as a man's head. When in this latter condition, and after heavy rain, it becomes a regular swamp, and most dangerous, for at one moment a horse will be simply covering his hoofs with it, and in the next he will sink up to his girths. When damp, it has the colour of a freshly ploughed field of earth; but as it dries, its saline nature becomes apparent, and it glistens all over with salt. When quite dry it usually has a glazed crust on the surface, through which a horse's feet break with a crackling sound into the soft, powdery soil beneath. In many places it is covered with sheets of salt of varying thickness; this, as the *kavir* dries, splits up into blocks, sometimes standing on end in sharp ridges 1 to 2 feet in height, or else into lines of blocks leaning against each other in the shape of a V reversed, thus Λ. In other places immense deposits of salt rock exist, of such extent and thickness that nothing can break or dissolve them; they therefore remain smooth and firm, and as hard as a thick sheet of ice, in all seasons. Of such a nature is the immense deposit of salt known as the Dariya-I-Nimak, which lies at the south foot of the Siah-Kuh, and extends for about 440 square miles. Such is its hardness, that even when submerged for 2 feet or more during the rainy season, it is said to still afford a firm foothold to the passing traveller.

As to the origin of the salt desert, many geologists believe that most of the deserts now existing were once the beds of seas, and science and tradition both assert that where the barren desert of Persia now stands, exposed in all its dreariness of sandy wastes and salt plains, a sea once rolled its limpid waves. I made a collection of various marine shells, including oyster-shells, between Chashma-Gauhir and Baba-Khalet at an elevation of 100 or 200 feet above, and within 2 or 3 miles of the *kavir* bed. I showed these to Mr. Staal, a German-Russian geologist, who said that they were of an extinct species, and that for a period of from eight to ten thousand years at least there had been no sea there. None of the old historians, either, mention any sea, a thing that could not possibly have escaped their notice. It is also stated in Sir Frederic Goldsmid's book that the volume of water from the Persian rivers is probably much less than it was formerly. Also the evaporation which goes on in the desert during the summer months is

* Usually accepted height. I made it 3595 feet.

† 2730 by my observations.

so great that it is impossible for the rivers fed by the slight rainfall which Persia now possesses to refill its bed.

After heavy rain vast sheets of water cover the *kavir* in places for several miles; but these, with few exceptions, disappear as the hot weather progresses. The vast salt deposits existing would appear to indicate a steady evaporation for ages.

Tradition asserts that the *kavir* was once covered by a sea called the Daria-i-Saveh; that ships sailed upon it; and that Husen-Nun, Kashan, Pir-Hajat, and other places, were harbours. It is also believed by them that the sea dried up, or disappeared, on the same day that Mohammed was born, and that all the fish were turned into stone; and they also point out occasional mounds on the *kavir* far larger than the biggest vessel ever yet built, and say they are the remains of old vessels that were stranded on the disappearance of the waters. There is possibly a substratum of truth in these legends, which, I suspect, the mullahs have added, ascribing a far more recent date to the events than was formerly given. The stories current about ports, piers, light-houses, etc., whose remains are said still to exist, may be dismissed as idle tales.

The sandhills, of which there are a great number, are described elsewhere. I do not think that the *kavir* contains one great central basin into which all its waters drain, but is divided up by intervening ground, which is slightly higher. One of these basins is the swamp into which the Kal-Mura river flows. The direction of the river until it joins the *kavir* is south; after entering it flows nearly west, and, after running 30 or 40 miles, terminates in a salt swamp surrounded by tamarisk bushes, a dense growth of which mark the river's course towards it. On my visit in the winter of 1890, I could trace its course easily, as it was in flood, and the bushes were a vivid green; whereas in 1888 it was nearly dry, and all the bushes had lost their colour.

The Kal-Dasgun, Kal-Lada, and Pir-Hajat rivers also probably form sheets of water.

Another swamp, fed by the drainage from the hills above Samnan, Aradan, Siah-Kuh, Kuh-Tulha, and the Gugird ranges, lies to the south of the latter range, and possibly joins the one that lies in the middle of the Rig-i-Jin. This is probably the largest of all, but in May, 1888, the south-west portion of it consisted of a vast sheet of salt, with a few pools of water here and there, while in September, 1890, there was a far larger quantity of water on it.

The lowest altitudes I found upon the desert were near Chah-Mehji, 2130, and Kal-Mura river, 2280 feet above the sea-level. There is also a large swamp below Kishlak, which extends eastward beyond the Kuh-i-Gitcha.

The climate of the desert is not subject to those great variations of temperature that might be expected. My observations in summer and

winter prove that they are no more than might be expected in these latitudes. The highest I ever recorded was 104° at noon on the *kavir* of Bajistan, and the coldest was about 39°, though it is possible that it goes as low as 31° or 32°.

The mildness of its winter may be accounted for by its low elevation, its shelter by high mountain ranges, and the ground being either so warm or impregnated with salt that snow dissolves as soon as it touches the ground. Also the water absorbed by the desert keeps it so moist that as soon as the sun rises clouds and mists are formed, which prevent any frost.

It is worthy of note that the date palm, which extends northwards from the shores of the Persian Gulf as far as a line drawn through Kamarij, Darab, and Forg, does not occur again until Zarin, Pusht-i-Badam, and Tabbas are reached, the intermediate country being so elevated and exposed that it is impossible for trees of this nature to live. They are also found in most of the villages and towns on the borders of the desert and at a similar elevation. The furthest north that I can remember meeting them was at Turut and Husen-Nun.

One of the most remarkable features of this desert are the Gugird or Sulphur range of hills, which, commencing near the Siah-Kuh, extend eastwards to near Husen-Nun; they have been described in my former paper. In some parts a bed of blue rock is to be found beneath the *kavir* at a depth of 15 feet.

There is some discrepancy between my maps made in 1888 and 1890–91, especially between the Kal-Mura river and Chashma-Dubor. The later map is probably the more correct, as it was made with a plane-table, and I was going over the ground for the second time, while on the first journey I lost my way after crossing the Kal-Mura, and did not get into camp till near midnight; the ground adjoining the *kavir*, too, blends so gradually into it in many places that it is difficult to lay down any hard and fast boundary, especially where rivers flow into it, whose mud has fertilized the surrounding soil to such an extent as often to cover it with a rich growth of grass and bushes.

On the 7th of May, 1891, I left Isfahan alone after a stay of a few days, and started with mules to trace the course of Zenda-Rud river from there to its termination, and then to make my way across country to Yezd. Isfahan is at a height of 5300 feet. Our route lay along the left bank of the river, which consists of fresh water, is deep in places, and flows very swiftly. It contains lots of fish, but they refused both fly and spoon-bait.

For five days we passed through numerous villages and considerable towns, which were dotted over cultivated land intersected by irrigation streams. Most of the villages had large pigeon-towers close by. These are similar in shape to the Martello towers along our coast, but with this difference—that the entrance is walled up, and the roof has on

it several smaller towers like pepper-pots, and perforated with holes. The pigeons fly in and out of these holes, and one tower will contain several hundreds. The dung they drop accumulates within the tower, which is opened once a year for the contractor to go in and collect all he can; it is used for manure, and is highly esteemed. I used to stand outside them, and, with the permission of the inhabitants, often make a good bag of blue pigeons with my gun; but as a rule, after half a dozen birds had been shot, the people became alarmed lest they should go away altogether, and I had to go to another tower elsewhere.

On the fifth day we arrived at Varzunna, an old town containing about 400 houses and an old mosque whose dome was covered with beautiful antique-patterned tiles. The elevation was about 5000 feet. In the afternoon I bathed in the river and swam under the bridge. On going down to the water and undressing, a crowd of about a hundred people gathered round me, and an old man, their spokesman, said, "What are you going to do?" "Why, bathe, of course," I replied. "But we can't allow that," he said. "You will be drowned, and then we shall all get into serious trouble. The Zil-e-Sultan will say it was our fault, and we shall catch it." But I told them I could swim, and after a lot of remonstrance, two men got ready to follow me to render assistance, and I plunged in. "Can he swim?" they asked my servants, who replied in the affirmative. This extreme anxiety on my behalf was rather amusing. After a good bath, in which many of the people accompanied me, I came out.

Next morning we recrossed the bridge and resumed the march along the river's bank. After following its course for about 10 miles, over a desolate plain, we entered a thicket consisting of tamarisk and numerous other bushes and trees, which were in blossom, while the ground was covered with green grass. At noon we reached the bank of the river, which had curved off to the south slightly.

This tract of jungle is known as the Gau-Khane (abode of cows), owing to the excellent grazing obtainable. The temperature at noon was 71°, and the elevation slightly less than that of Varzunna. The river at this point is very deep, broad, and swift. Just beyond us it divided into a number of channels, forming a sort of delta, through which it flows for three or four miles before arriving at the lake. The place is said to be full of wild pig, and I saw lots of wild duck, which evidently stay here to breed and rear their young in the impenetrable thickets. There are numbers of sea-gulls and other water-birds about.

Next day we made a *détour* to avoid the swampy ground, and after going 8 miles reached the shores of the lake. From this point the water rolls its waves over a vast area, and appears to stretch away beyond the horizon; a delightfully cool breeze was playing over its surface. The temperature at noon was 79°, and the elevation by boiling water was 5215 feet; it is probably about 4950. The lake is about 25

miles in breadth from east to west, and perhaps 20 to 30 miles from north to south. In December, 1890, I viewed the lake from the Lagharek pass on the high-road between Isfahan and Nain, when its further southern shore was distinctly visible, appearing as a high and yellow bank, probably of sand, and I got bearings on a low red hill called the Takht-i-Sorokh, which is said to be just beyond its southern margin. Where I now stood we were within 200 yards of the water's edge, whose colour was a brilliant green except close inshore, where it was of a yellowish colour. Arriving within 30 yards of the water, a long bank of fine grey gravel about 12 feet high and 30 yards thick was reached. It had three successive water-marks on it, one at 8, another at 6, and the last at 1 foot. This latter, the most recent, consisted like the others of small driftwood, but contained in addition feathers and wings of sea-birds, and myriads of the bleached bodies of locusts. Beyond this beach lay a level expanse of soft clay, into which one's feet sank deeply. Passing over about 30 feet of this mud, the water's edge was reached, but it was so shallow that after going 30 yards into it there was only a depth of 18 inches. It was excessively salt. Flocks of white birds were resting on the water further out, and the scenery, though wild, was very picturesque. It is said that towards summer the southern end of the lake dries up and exposes a great sheet of rock salt, similar to that on the Daria-i-Nimak.

Kavir is here witnessed in what I suppose is the process of formation: first smooth mud near the water's edge, and then every stage, up to the dry brown plain, pitted with holes and studded with dry saline excrescences. The thicket previously mentioned stretched for 7 or 8 miles along the western shore of the lake, behind which was a high chain of sandhills. The desert between Abarguh and Chah-Beg, where there is *kavir*, drains northwards into the lake, but stretches south for many miles past Abarguh, Hashimabad, and Robat. The Zenda-Rud pours down a great volume of muddy water during the winter months, which is gradually filling up the northern portion of the lake. There are said to be no fish or shellfish, the water being far salter than the sea; the northern portion of the lake is said always to contain water, though in summer the river dwindles away to a small stream.

Leaving the lake, we ascended the hills to the east to Khargoshi, where there was a fine caravanserai built by Shah Abbas. The elevation was 6340 feet. Two more marches brought us within the Yezd district to Nodushan. This is a town of about 300 houses situated on both sides of a broad and dry gravelly watercourse, which flows through a broad pass in the hills to its north-east and drains on to the Yezd plain. It is down this pass that the best and shortest route to Yezd runs. There are low hills on either side of the town, which contains gardens, trees, and cultivation. The climate here was

delightfully cool and bracing, and the inhabitants were very civil and obliging. Its elevation is 6670 feet, and it is in the Pusht-Kuh region of the Kohistan. It is on the west border of the Yezd hills, whose base we skirted for the next two marches.

As I was riding along in rear of the caravan the following morning, I saw my groom stop suddenly and dismount, and, taking his gun, run towards a hill on the right, so I turned off and rode round the back of the hill, where I saw a very large and fat wolf, which made off into the hills. The groom said as he was riding along he heard the greyhound that was following him cry, and, looking round, saw a large wolf crawling up to him. A little further on we met a shepherd, who said he had lost no less than fourteen sheep during that spring, which were carried off by the animal in question, which had been following and watching his flock for weeks.

Next day we crossed a pass 8400 feet above the sea, and reached a valley covered with villages in the Pusht-Kuh district, and two days more brought me to Yezd, where I heard that there was a movement against the Babis, three of whom were executed by having their throats cut by the public executioner, and were then stoned to death by the populace, after which their mangled remains were cut in pieces and exhibited to the victims' wives and children. I heard that the men who suffered showed great fortitude, and, though told that they had only to say that they believed in the true Mohammedan religion, that their prophet was false, and their lives would be spared, scorned to do so. I was also told that these persecutions would give a great impetus to the movement, and that each death caused numerous converts. This was my third stay at Yezd, during which I had been the guest of the Ardeshires, Parsi merchants, three brothers, who divided their time between this place and Bombay. I also visited the Parsi school built by one of them, where there were 150 boys, out of which 20 had learned to read English. The Parsis of Yezd—that is, those who live in the neighbouring villages—are of fine physique, and are noted for being good gardeners and cultivators.

My next journey was from Yezd to Abarguh, and thence on to Abadeh. The first part of my route lay through Taft, and then on to Sanijh, up in the hills at an elevation of 7700 feet, a beautiful and fertile spot. The houses were all mud and stone; but the curious feature of the place was the number of beehives, consisting of long coffin-like boxes, which encumbered the ground in every direction, so that one had to be careful. Crossing a pass 8400 feet in height, and descending, we arrived at Turum-Pusht, where there is a celebrated marble quarry. The prevailing colour of the marble, which exists in great quantities, is a pale transparent lemon hue, but there are red and white variations; the deeper they go the finer the colour. The quarry is free to anybody who likes to go and work it. The inhabitants work

as orders arrive, and can carve fairly well. The marble is in great request for tombstones, and large numbers formed of this marble are to be seen in Yezd and other towns. There are some old towers in the place, with inscriptions said to date from A.D. 1290.

The next place passed was Chah-Beg on the *kavir*, a mud fort about 5150 feet in elevation. The inhabitants were all suffering from skin-disease; the hair of many was falling off in patches, and they were clamorous for medicine, so I dispensed a carbolic lotion in large quantities to them. In fact, at nearly every village I went to the people wanted medicines, and got quite angry unless they had them. Having had some experience of their expectations in this direction on a previous journey, I had provided myself with twelve gross of antibilious pills and lots of quinine, which went a long way. Bad eyes are what they appear to suffer from chiefly.

Next day we reached Abarguh, with five or six thousand inhabitants, on a fertile plain on the west of the desert we had just crossed. Its height was about 5300 feet.

Two more marches brought us to Abadeh, a well-known town on the high-road between Isfahan and Shiraz, where I stayed in the telegraph-office with Mr. Glover. There were two tame panthers in the house, which he had procured from the neighbouring hills.

I left Abadeh on the 9th of June, taking with me two mounted attendants of the Governor of Shiraz, without whose assistance I might have had trouble with the nomad tribes, who wander about the mountainous country west of the high-road between Abadeh and Shiraz, which I was now entering.

On the first day we travelled within sight of the high-road and reached Eklid, a large town up in the hills, at an elevation of 7700 feet, a picturesque spot and very fertile. The governor, Agha-Khan, was very civil. After halting one day, we left the place and crossed a pass of about 8300 feet, and descended on to a plain where there were several thousand black tents of the Kashghai Arabs, whose flocks wandered in thousands over an immense grassy and well-watered plain. We halted at a small mud fort on its borders belonging to the Bakhtiaris, who had a row with my servants, and came rushing out of the fort with guns, the women carrying sticks and stones. However, they finally retired to the fort, shut the gate, and said they would shoot anybody who came near. We sent off to the Kashghais for assistance to procure us food and supplies, which they gave us, and all ended peaceably, the headman of the village being taken into Abadeh and bastinadoed before Mr. Glover a few days later for his incivility.

Next morning we halted at the camp of Isau-Beg, a Banseri, and later continued our march. As a rule, a khan's tent could be distinguished by its being of a white or coloured texture. I was told that most of the khans of the tribes have some of their sons or near relations staying at

Shiraz, where they become hostages for the good behaviour of their tribes.

A day or so further on brought us to Asupas, a small fortified place perched on a rock on a plain. A fine stream rises from a pool at its foot of very clear water, out of which, during a day's halt, I obtained some of the best fishing I have had anywhere, with a cast of three trout-flies; the fish ran to 1 lb., and rose readily. I got about twenty-five in the first hour. Lots of the inhabitants, and a regiment of Persian infantry halted there, came down to see the, to them, astonishing method of catching fish by their rising to an artificial bait thrown on the water. The regiment, which was the Sarawand infantry, were very orderly and well behaved, and did not appear to annoy the inhabitants in any way—a pleasing contrast to stories I have read, which described their march as dreaded by the villagers only in a slightly less degree than that of an invading army.

Near the town is the historic Gur-i-Bahram, a swamp in which King Bahram, while hunting the wild ass, got engulfed; his body was never recovered. It is also said that a gunner attached to the embassy of Sir R. Morier was drowned in the same place some sixty or seventy years ago. There are pools on it, out of which I got some 2-lb. fish with a fly; dry fishing. Large swamps covered with rushes abound in the neighbourhood, and are full of wild pig. The colonel of the regiment kindly put a guard over my tent to prevent any annoyance from the men.

Next morning we passed a grassy plain called Shah-Nishin, a favourite resort of the Persian kings. More passes and more plains and villages of similar nature brought us to a pass called by the cheerful name of Durrah-i-Duzdan, which means either the road or gate of thieves, a former haunt of those gentry. Over the pass, 8000 feet in height, and down into a picturesque valley through which the Kur river flowed, and on to Khan-i-Mun town. Above us to the south-west on the opposite side towered the Kuh range, about 14,000 feet in height, and covered with snow; and away to the west the distant summit of Kuh-Dinar was just visible. The town stood on the river-banks at 6000 feet. The khan was very friendly, and we stopped for one day. There were a lot of greyhounds in the village, and I bought two for half a crown, both of which were fine animals.

On leaving the town we forded the river, a fine clear stream about 40 yards broad, and ascended the mountains, passing through a forest of dwarf oak. In the evening, having reached 7300 feet, we halted at the Lur village of Talkun. Next day we ascended over a pass 8200 feet, and, descending into a valley, reached the Shaspi river, where the water rushes out from under a rock in a large clear torrent. Here we breakfasted.

One of my gun-barrels had got seriously dented by a fall. So I

heated the dented part in the fire, put in a ball-cartridge, and placed the gun behind a rock and fired it with a string to the trigger. The experiment proved successful; the dent was removed, and the gun became serviceable again. A Persian khan told me this was the way he always put his guns right.

We then climbed over the Kuh-i-Guer by a pass 9000 feet in height, where large patches of snow were lying about, and descended to Ardakan, a town of about 2000 inhabitants. The houses were nearly all built of wood, with large projecting eaves, and there were plenty of oak, walnut, and willow trees about. Height, 7700 feet.

The next march lay over a fertile plain, where we met the Shaspi river once more, and crossed it by a bridge near its junction with a stream from Ardakan. Then, descending down a very steep hill, we arrived at a village called Rudyan, at the bottom of a gorge between precipitous cliffs several hundred feet in height, which the river reached from the plain above in a succession of leaps. It was a very picturesque spot, shaded by fine walnut trees. There were three khans staying in the place belonging to different divisions of the Maimusenni Lurs, with whom I interchanged visits. Firearms were the chief topic of conversation, and they were much interested in my description of the new magazine rifle and of machine guns. They had some Winchester rifles amongst them, and shot very well. Elevation, 5900 feet. I caught some 4-lb. fish here with a live grasshopper.

On the second day one of the khan's sons took me to the top of a cliff about 3 miles off, where a stream fell down into the ravine below, a sheer drop of nearly 300 feet. There were lots of wild pigeons about. After going 6½ miles we struck the river again, and left it flowing away towards Kaleh-Safeid, a hill off to the west. We halted at Deh-Bawa, a Lur village on the borders of a forest, which we entered the next morning, and climbed over a pass on the Kuh-Nar 8500 feet in height, and descended into the valley of Bonru-Maidan, where the Kasghai Arabs were encamped of the *taifa* (division) *Ardeshiri*, which is, I believe, the Persian name for Artaxerxes. Elevation, 7500 feet. A horse here broke loose, and in trying to stop him a Kashghai was knocked down senseless, at which the tribe were very angry, and said it was my muleteer's, his owner's, fault. However, a little brandy soon revived him, and calmed his wife, who made a great row.

The next march over a pass brought us to another camp of nomads, and the day after we left the forest and arrived at Nudan, the first Persian village built of stone and mortar I had seen. The people were Lurs. The headman visited, and I noticed he sat down without removing his shoes. I asked the prince's servant the reason, and he said, "Oh, he's only a Lur; what can you expect? Besides, he has so many enemies about that he daren't even take his shoes off, for fear of being caught unprepared."

Leaving the village, we crossed the Shahpur river many times, and passed through a gorge amongst ruins and reached Shahpur. There were numerous ruins about of fine large blocks of stone, well squared and adjusted, and a fort on a hill, said to be the remains of the ancient city of Shahpur; there were also some fine sculptures on the adjacent rocks, in which the proportions of the figures and the graceful draperies reminded me of ancient Grecian work. They were in high relief, and, although much disfigured as regards the faces, the limbs of horses and men were sculptured with great regard for the correctness of the anatomical details.

It was now June 22, and the elevation only 2700 feet; the heat was consequently very great. A further march of 6 miles brought us on to the high-road between Shiraz and Bushir, about 11 miles west of Kazerun, so that we were now under the telegraph wires and on well-known ground. A few more marches by night brought us to the Persian Gulf, and as we neared it the thermometer stood at 105° in the shade at noon.

The march from Abadeh had been a most interesting one, on account of the beauty of the scenery and the numerous nomad tribes then inhabiting it. In winter the country is completely covered with snow, and the tribes move down to lower ground in the south, where they can continue to feed their flocks. I met one of these tribes on the march; they were a curious sight—herds of cows and immense flocks of sheep and goats grazed on what they could pick up as they passed along, while the women and children of the tribe were riding on donkeys, mules, and horses. There were numbers of pack-animals, heaps of large sheep-dogs, and mounted men armed. They made a great noise, and raised clouds of dust. The country between Abadeh and Kazerun has frequently been traversed by Europeans before, but all by routes from north-west to south-east, and I must have crossed half a dozen of their routes at least during my trip across this latter portion of country.

THE LAND OF THE BATAKS.*

By Baron ANATOLE VON HÜGEL.

As with other Malay races, Batak fashion prescribes certain mutilations of the body. In boys, at the age of puberty, the teeth are reduced in length by means of the chisel, mallet, and file, and are given a concave surface. When thus shaped they are tinted black, and in the rich these blackened teeth are embellished by being inlaid with gold or mother-of-pearl; or they are even quite hidden under a thin plate of

* 'Besuch bei den Kannibalen Sumatras. Erste Durchquerung der unabhängigen Batak-Lande.' By Joachim Freiherr von Brenner. Würzburg: Leo Woerl. 1894. Large 8vo, pp. 388. *With* 2 *maps*, 7 *plates* (6 *coloured*), *and over* 100 *engravings*. Continued from the January number.

gold. In girls, the incisors are cut off level with the gums. Large perforations in the ears are considered beautiful, and both the upper rim (helix) and the lobe are pierced, the holes being gradually enlarged through youth.* Von Brenner does not speak of tattooing, nor of the scarifying of the body.

In dress these people conform largely to the ordinary Malay ideas. They weave in their hand-looms cotton fabrics of good design and colour for their sarongs, head-cloths, scarves, etc. Children go naked to their seventh year, but wear many metal ornaments.

Bataks are skilled gold and silver smiths: their ornaments are remarkable both for beauty of design and extreme delicacy of workmanship. They include bangles, belts, necklaces, and ear-ornaments. One form of the latter called *padung padung*, worn by Karo women, is very peculiar, resembling a double fish-hook the barbs of which have been replaced by flat spirals, and is curiously like a favourite design of the bronze period. Sometimes this ornament is of unwieldy dimensions, the silver of as many as sixty-two dollar-pieces going to the making of a single pair, and it is consequently so heavy that the upper end of the spiral must be fastened to the hair or the head-cloth. It is the silversmith's work to attach the *padung padung* to the ear. When half finished, he thrusts it through the hole in the helix, and turns one of the spirals when the ornament is *in situ*. Only for the very wealthy is the *padung padung* so fashioned as to allow of its removal from the ear. A golden star is sometimes set in the centre of each spiral. Of the less abnormal and more delicately worked ornaments, some varieties are only worn by men.

The artistic sense of the Bataks finds further expression in wood-carving and in decorative painting. Beautiful and elaborate designs, made up of geometrical figures, or conventionalized flowers, leaves, animals, etc., often very tastefully picked out in colour, adorn many portions of the interior and exterior of their houses. Rough, plain earthenware vessels, hand-made, *i.e.* without the aid of a wheel, are made by the women. Household utensils, water-vessels, boxes, troughs, hen-coops, etc., are made, almost without exception, of bamboo. No special head-rest is used. The Bataks fabricate their dagger and knife-blades from imported iron, and also prepare gunpowder and bullets for themselves. They are fond of music and dancing; their musical instruments do not seem remarkable.

Unlike their lowland neighbours, these people choose elevated sites for their dwellings. Their villages, which may be composed of from half a dozen to over two hundred houses, have a quaint charm of

* Dr. Hagen's paper, "Die Künstlichen Verunstaltungen des Körpers bei den Batta," gives a detailed account of these and other processes. Drawings of the instruments used, and of the mutilated teeth, as also of the ears bearing the huge Karo ornaments, are given. *Zeitsch. f. Ethnologie*, 1884, p. 217.

appearance quite peculiar to themselves. The houses, including the public buildings, are irregularly placed, but for each class a distinct orientation is always observed; thus, should the dwelling-houses face east and west, the other buildings will face north and south, and *vice versâ*, the two classes of buildings in one village never coinciding in this respect.

A strong palisade of bamboo immediately surrounds and guards the village, to which access is given only by one or two very small openings; but in some districts a stone-covered bank, strengthened occasionally by a fosse, takes the place of this fence. Beyond lie gardens and small fields, in their turn protected by a thicket of thorny bamboos, bushes, and large sting-nettles; while, in Karo-land, a copse, or even a fair-sized wood, must still be traversed before the village confines are finally left behind and the treeless plain re-entered.

A Batak house, like those of the Dyaks and of other related tribes, is a pile-dwelling, though not built over water. Its stout wooden floor is raised on wooden columns 10 to 15 feet in height, and projects as a wide platform in front of the doorway, which, barring an occasional very small window, is the only opening into the house. This platform is reached from the ground by a rough ladder or notched bamboo. The plank walls are barely 4 feet in height; they slope outwards, and bear an enormous, high-pitched, saddle-shaped roof, thickly thatched, and with deep overhanging eaves. Most often each end of the bent ridge-pole bears a great buffalo-head, with ears and spreading horns, cleverly fashioned of *hidjuk*, the durable net-like fibre produced by the sugar-palm, which is also largely used as a protection to the thatching.

Of these dwelling-houses (*rumah*) there are three recognized varieties, viz. "the chief's," "the rich man's," and "the poor man's house." The first is more elaborately decorated than the second; the third is quite plain, and varies slightly from the other two in constructional details. From ground to ridge the height of a *rumah* may vary from 30 to over 50 feet. There is also in each village a *bale* or *sopo*—the men's house—a *lotsung*, the *inggot bâge*, and the *griting*. The *bale* is the most beautiful building in the village, and differs slightly in design and ornamentation from any of the three varieties of *rumah*; in the *lotsung* the women husk the rice, and it is their meeting-place, as the *bale* is that of the men. The *inggot bage*, the rice stores, which, like the houses, are supported on posts, vary in number in different villages. Lastly, the *griting*, the houses of the dead, which in shape somewhat resemble those of the Dyaks of Borneo, of which Bock, in his 'Head Hunters,' gives illustrations. In Karo-land these tombs are diminutive models of the dwelling-houses, about 4 feet in length. Within is a wooden coffin, mostly boat-shaped, and beautifully carved and painted, and in it the exhumed skull and larger bones of the dead man repose. In some districts the *griting* are much larger, and differ somewhat in design:

sometimes they are dispensed with altogether, and then the corpse, enveloped in mats, is suspended in the open from a horizontal bamboo, which is lashed to two uprights. No ground is set apart for the dead, and the *gritings* may be found singly or in groups in any part of a village; but, as cremation is also practised, they are not very numerous. Children who die before cutting their milk-teeth are buried under the floor of the houses, to secure their bodies from being used for medicinal purposes. Stables for horses, enclosures for buffaloes—these latter always built outside the village palisade—and a smithy, with various sheds and out-houses, are among the additional buildings which are frequently to be found in a Batak village.

The domestic animals of the Bataks are numerous. Their small strong breed of horses (*kuta*, *huta* = Hindostanee *kuda*, horse) has so distinct a character of its own as bespeaks long existence in the country. Averaging 12 hands in height, well built, and remarkably sure-footed, the Batak pony is in considerable demand, not only in the Dutch colony, but in the adjacent British dependencies. Strange to say, these horses are only reared for export, as the Bataks are in nowise an equestrian people. The cattle are small, zebu-like animals with short horns, and mostly brown in colour. Milk is scarcely ever used as food. The buffalo of these highlands is of strong build, and distinct in breed, both from the Javanese and the Indian, is reared to be solemnly slaughtered and eaten on great festivities. Herds of semi-wild buffaloes infest certain districts. Goats are scarce and little thought of. Pigs are reared by all, and by their number the wealth of their owner is told. These lanky brutes, with stiff mane and long black bristles, have skulls which closely resemble those of the *Sus scrofa palustris* of the Swiss lake-dwellers.

In the dogs, which abound in every village, and which in appearance resemble the Indian *paria*, we find an interesting breed which, like the pigs, takes us back to prehistoric days, their skeletons closely resembling those found with the remains of the earlier European lake-dwellings. These animals are very gentle and timid in disposition, and no European has ever succeeded in making friends with them; but they live in the Batak houses, and have learnt to run with ease up the rickety ladders by which the door is reached. It is the fashion for a puppy to be brought up with each child, and it is the duty of the *caban*, as this dog is called, to keep the baby clean. The *caban* is well treated, but the other dogs have to look out for themselves. Some of the dogs are roughly trained to hunt the quail. Cats are scarce, and a tailless breed seems to be developing itself. Fowls of a degenerate breed are found everywhere; pigeons only here and there.

The fields and gardens are tilled with great care; it is the work of the women, the men helping them only occasionally. The Batak plough is very small and of primitive construction. It is drawn by a buffalo,

or, as often as not, by a woman. For digging a long spear-like stick is used. A number of women stand in a row, each holding one of these digging-sticks in her hands; these they thrust simultaneously into the ground, and, shaking them vigorously, quickly detach large sods of earth. Rice, of which there are many varieties, is by far the most important of the crops; but a good deal of maize (which grows low, but bears well) is grown, also sweet potatoes, a few species of beans and other vegetables, herbs, and spices. Coffee is often to be seen in their vegetable gardens, cultivated, not for its berries, but for its leaves, which are dried over the fire and used like tea. Tobacco does not flourish in the highlands as it does on the lower slopes of the coast land, but a good deal is planted; and recently the opium poppy has found its way up country.

The *slaun* or *sanam* (*Marsdenia tinctoria*), a low-growing, large-leaved creeper, discovered by Marsden in 1780, is preferred by the Bataks to the indigo-plant for the fine blue dye which it produces, and it is consequently much more grown than the latter. Tapioca, cotton, the papaya, and the *pisang* (banana), are only cultivated in the low-lying districts. Boiled rice is the diet of the people, though a certain amount of meat—both fresh and dried—fish, vegetables, fruit, and spices are also eaten. A palm-wine, *migab* or *paulo*, is prepared and drunk when half fermented. It is slightly intoxicating, but drunkenness seems to be quite unknown. Men and women are inveterate betel-nut chewers.

Large game, which is confined to the wooded region, is killed with the blow-pipe and poisoned darts. Quails are found in the grass-land, and are hunted in a very peculiar manner. The hunter is armed with a *rewa*, i.e. a stiff 12-foot bamboo rod surmounted by a small kite-shaped frame on which a net is stretched. Trained dogs find the birds and put them up, and the hunter, with surprising agility, catches them in this singularly inefficient-looking contrivance. For monkeys they have a strange trap—a kind of guillotine, the wooden knife of which imprisons in its drop the hand or neck of the little beast, when stretched out to seize the fruit with which the trap is baited. Fish are caught with net and set lines; sometimes also with the *dusun*—an ingenious automatic rod and line. It is set by means of a string attached to the snood, which is so fastened underwater to the bank, that the wriggling of the hooked fish releases it, when the springy bamboo rod, stuck into the bank, flies up and lifts the fish out of the water.

The Bataks have two sorts of canoes—both "dugouts"—the *solu bolon*, used for war or commerce, from 30 to over 100 feet in length, carrying from 30 to 150 men; and the *solu ratsaran*, or fishing-canoe, which, as a rule, holds only one man. Some *solus* are provided with outriggers. The bows of the *solu bolon* are ornamented with a carved upright piece of wood, often representing a human mask.

The social life of the people has many characteristic points. Exogamy is the rule, and blood-relationships, even the most distant, are respected. Polygamy is rarely practised, though an acknowledged institution. There is no "chief wife," but all the women of one household have an equal standing. A bride is purchased from her parents, the marriage-money varying from 50 to 120 Spanish dollars. Few youths under seventeen are consequently married, as some time is required to save so large a sum. Clothes and ornaments are the wife's only dowry. She is well treated, though hard worked. A man is bound to take to wife his brother's widow. As soon as a child is born, the *guru*, or fetish-man, is asked for its horoscope. He has also to select a right name for it, which he finds in the following manner. "A name is mentioned; he thrusts his hand into a heap of rice, seizing what he can with three fingers, and then counts the grains, pushing them aside by fours. Should the total be divisible by four—*i.e.* no grain remain over—and should this occur thrice, then is the choice ratified; but should this not be the case, new names have to be sought for till the manipulation has succeeded three times." The *guru* finds the names by the aid of "luck-tablets"; but occasionally his services are altogether dispensed with, as the father, on account of some dream or inspiration, acts in his stead. It is the father, also, who performs the actual ceremony of naming—a ceremony strangely resembling Christian baptism. He takes the child to some running water, washes it, and pronounces over it the name, as well as a special formula. Circumcision is practised, but without attendant ceremonies.

The religious belief of the Bataks is peculiar and suggestive. It acknowledges one god (*Debata*), an almighty being creator of the world, and his three sons—the god of justice and teacher of men, the god of benevolence, and the god of evil, the tempter, to whom, of all three, the greatest influence is ascribed. To the sons the father gave the management of his creation, and they, in their turn, have as deputies many smaller deities or spirits (*begu*)—of the sky, the earth, and the lower world. Spirits are found everywhere and fill every place. The legend of the creation is very strange and weird. The only representative of a priesthood is the *guru*, sorcerer and prophet. Those of the *Pakpak* tribe are the most renowned. The *guru* knows the qualities of the *begus*, who cause all diseases, and he can influence them. The *si basso* is a person possessed by a *begu*, who acts the part of a medium; there are many of these, both male and female. The insignia of a *guru* is a small carved staff, hallowed by many strange and horrible rites, and deriving its special powers from the presence of a particle of the brain of a boy, cruelly tortured to death as part of the ceremony of its consecration. Fortunes are told by the aid of the *perhalaan*, or luck-tablet, a small quadrangular board divided into squares, which are inscribed with mystic signs and symbols. Auguries are read from the viscera of

animals, etc. Special qualities are assigned to each day of the month. Wooden fetishes, rudely carved to represent human figures—by Von Brenner erroneously called idols—are made by the Bataks. They are scarce, but a great variety of amulets are worn, the strangest of these being an armlet made of the lips of an eaten human being, which foretells danger to the wearer by becoming loose on his arm.

Of medicine the Bataks possess some knowledge. Their specifics are chiefly vegetable, but they have also many superstitious remedies, among which human flesh plays an important part. A form of massage is practised. The sick are well tended, but abandoned as soon as life is despaired of.

Cannibalism, and of a most barbarous kind, is practised by all the tribes but one; amongst some it is even a legal institution. At times the flesh is cut from the living victim, but it is usually provided by those slain in war. The Karo tribe alone appears to be entirely free of this practice. By some tribes the hands of those eaten are preserved by smoke, by others the lips are chosen. Skulls are greatly prized, and, in bunches, often adorn the *bale*. A human tooth is frequently let into the cover of a box, so that as often as the box is opened, the tooth may be struck and its former owner insulted.

A well-defined though unwritten code of laws exist. Offences are punished by money fines or by death, the latter sentence sometimes including the eating of the condemned person. Grave offences are adjudged by the chief and people; lesser ones by him alone. Oaths are taken, but by men only. They are sometimes sufficient to clear the accused. A prolonged drought is considered as a sign that a special crime against morality has been committed. Neighbouring villages then unite to discover the guilt or innocence of those on whom suspicion has fallen by the strange ceremonial test of the "rocking-baskets," which seems akin to the idea of table-turning.* But strangest of all is one of their acknowledged methods of obtaining redress for an injury, viz. the *musu berngin*, or "night enmity." Three letters, consisting each of a large inscribed bamboo-leaf, are attached, one after another, at regular intervals of time, against or near the offender's house. The first is a simple demand for inquiry into the grievance; the second an emphatic demand for redress; while the third, which may be decorated with miniature knives, spears, and torches, pronounces a threat of arson and murder against the offender. Of these threatening letters one which Von Brenner translates ends as follows: "My home is soaring in the mountains, my name is hawk, my father is the night ape in the mountain," and is signed, "The heart-sickened one."

The Bataks are constantly engaged in petty feuds, which consist largely, however, of threats, feints, and empty words. In serious war

* The author, p. 212.

they will sometimes fortify a position with entrenchments, though the palisades and ordinary defences of the villages are in most cases considered sufficient to keep off attack, the enemy's approach being also hampered by spiking the paths with concealed pieces of sharpened bamboo. They manufacture their own gunpowder, and, apparently with the idea of increasing the brilliancy of the flash and the noise of the explosion, particles of leaves, which have been plucked during a thunderstorm or an earthquake, are mixed with its ingredients. Guns and rifles, with home-made stocks, have replaced all native weapons but the knife and the dagger; and of these, though each tribe has its own variety, none are specially noteworthy. May not the form of these knives, etc., have been influenced by the weapons regularly imported by Dyak traders (see footnote, p. 5)? With the Bataks, as with the Coast Malays, a dagger is part of a man's full dress. Spears and the small quadrangular hide shields are now scarce ever seen.

The Bataks possess a literature of their own. Their *pustakas* (*pustaka*, a pure sanscrit word signifying "book") are made of a continuous strip of bark which, in Chinese fashion, is folded into book form, and is written on by means of a style. These books treat almost exclusively of matters connected with sorcery, medicine, religion, and the like, and are generally kept by the *guru*. The alphabet in use has been affirmed by some writers to be of their own invention;* but this is an error, for their characters have been traced back to the Indian mainland. As Keane observes, "The Batak is one of the eleven Malayan writing systems, which are ultimately based on the archaic Devanâgari of the Asoka inscriptions," out of which seven still current, four are found in Sumatra.† The Bataks have a tradition, which Von Brenner gives as follows: "that all learning and books have sprung from a great bamboo which one day shot up in Timor; as the leaves dropped from the shoots they proved to have been written on by *Debata*, and the *gurus* transferred these signs to books."

It remains to be said that the work is well illustrated, and this is all the more creditable to the author, considering that he lost a large number of his negatives and drawings. Two maps are given: (1) the independent Batak lands around the Toba lake; and (2) on a larger scale, the land of the Karo Bataks. An excellent idea of the mountain ranges may be gained from two plates of panoramic views drawn in outline. There are also five plates (four of which are coloured), representing native carvings and book-illustrations. But the general reader will be most interested in the many excellent engravings of the scenery, the people, their manufacturers, etc., which have mostly been reproduced from photographs taken by the author. We cannot, however, but regret

* Stanford's 'Australasia,' p. 340.
† *Ibid.*, Appendix, p. 624.

the space given in a book of serious travel to portraits of private friends, and to such meaningless embellishments as those which adorn the commencement of each section. The book would also have greatly gained in value if Baron von Brenner had marked more clearly which of the many interesting facts collected by him we owe to his own personal observation, and which to his careful study of the works of previous travellers. This is especially regrettable in the chapters which he devotes to the people. There is, it is true, at the end of the book, a list of authors, but this helps us little, as but few references to their works are given in the text. We farther are at issue with the title of the book, 'Visit to the Cannibals of Sumatra,' as being both sensational and misleading. The author spent some weeks with the gentle Karo Bataks, who are not cannibals, but he only made a rush through a portion of the cannibal districts, during a large part of which time (a week) he had no alternative but to remain afloat upon the Toba lake, and consequently saw but little of the inhabitants of its inhospitable shores.

These few criticisms would not suggest themselves if the book were not in itself so excellent, and one which we can cordially recommend to any who may wish to inform themselves fully about a most interesting and little-known region.

A VISIT TO LAKE CHIUTA, BRITISH CENTRAL AFRICA.

By ROBERT CODRINGTON.

[The following extract, from a report to Her Majesty's Commissioner and Consul-General for British Central Africa, by Mr. Robert Codrington, Assistant Collector in the Zomba district, has been kindly placed at the disposal of the Society by the Marquis of Salisbury.]

I left Chikala Fort on the morning of August 6, and proceeded down the north-east slope of the mountain to the Ngande river without incident. My party consisted of five Sikhs, eleven armed Atonga, and sixty-two porters from the chief Chechikweyo. After crossing the Ngande river I continued down the Mikoko river, my intention being to follow the path to Madziabango across the dry bed of Lake Chilwa. That night I camped at my old camp at Chenapini on the edge of the Ntoradenga swamp. On the morning of the next day, August 7, I marched on to Madziabango, where there is a plentiful supply of water in pits, which is, however, bad. As I approached the place, people were seen running away, fires were burning, and some grain was left behind which was in process of pounding. About 2 miles from Madziabango I turned to the north-east at a place where the path diverged to Zarafe's, Kawinga's, and the probable road to the coast. I camped that night at Panakatope swamp, the water of which was very bad.

The following morning, August 8, I proceeded to Nachimbwe's

village. The village appeared very large, and stretched for 4 or 5 miles along the edge of Chiuta, which here for the first time showed any appearance of open water.

The next day, August 9, I spent on the lake, visiting Chiuta island, from the highest point of which Chikala and Zomba mountains were distinctly visible. There are no people living on the island, on account of its being rocky and unfitted for cultivation, and only accessible at one or two places with great difficulty owing to the grass. On the west side of the island no open water was visible, but the swamp appeared to extend a considerable distance to the south-west. I noticed that the water was called "a river" ("lusulo") both here and elsewhere, and not "a lake," and that Chiuta referred to the island,* and in a general way to the whole district.

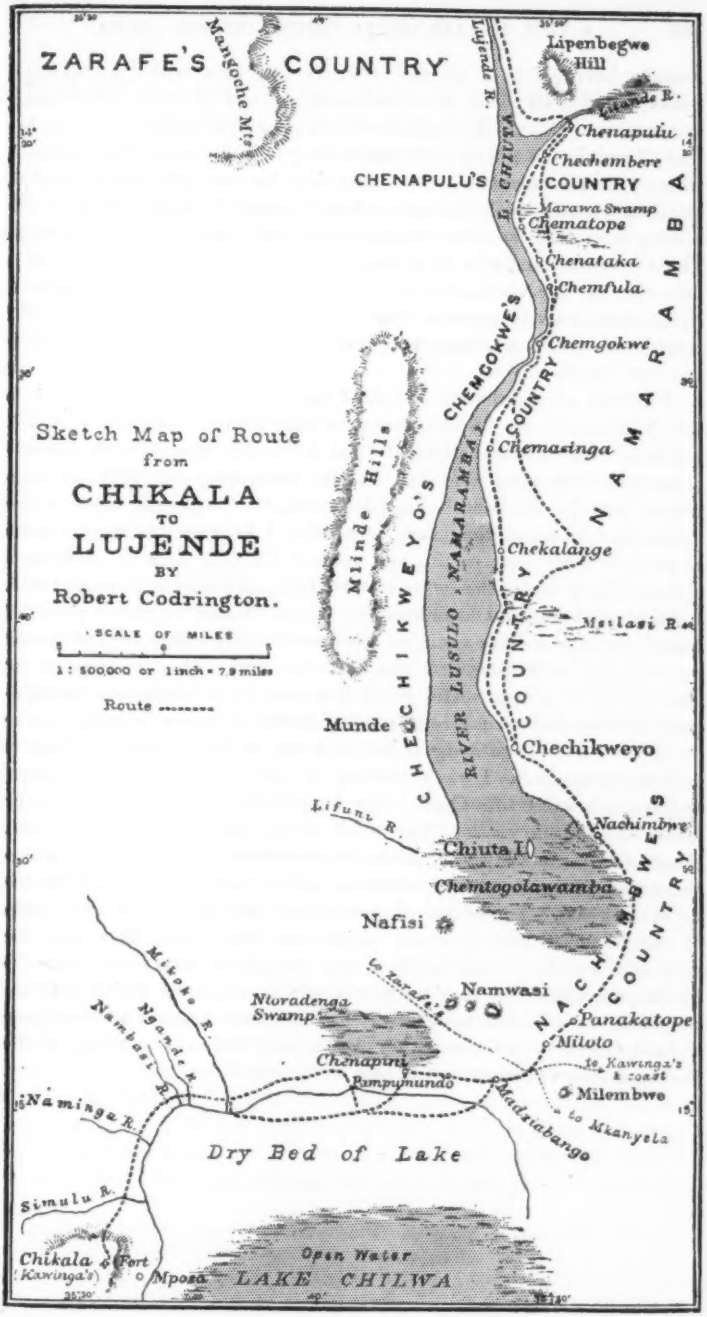
From Nachimbwe's I proceeded to Chechikweyo's town, which is 6 miles to the north, where the river was at its broadest and almost entirely free from grass. The depth of the water here and at the other places I visited varied from 3 to 12 feet, and was for the most part 5 or 6 feet. I then proceeded to Chemgokwe's village, 21 miles, there being a succession of villages all along the river. The river was much narrower here, 350 yards. All the houses were built on piles or on ant-heaps, of which there are many. On the following morning, August 12, I marched on to Chenapulu's, 12 miles, whose villages stretched along the river, which is here joined by the Litande and Lujende. The water is completely open and free from grass, and is about 700 yards across at its greatest breadth.

I then crossed the Litande, and marched up the Lujende river in search of a ford by which Zarafe's people are said to cross on occasions in going to and from the coast. I was shown a path leading south-east, and told that the ford was two days' journey up the Lujende river, and understood that the Madziabango path was the most likely route for Zarafe's people to go out by. I then returned to Chenapulu, and witnessed the arrival of a caravan from the coast (Kumbwane) which had been absent two months. The next day, August 13, I started back, taking a slightly different route entirely along the side of the river. I arrived at Chechikweyo's on August 15, and paid off my carriers according to agreement, relying upon Chechikweyo's promise to supply me with carriers back to Zomba.

I found, however, that, owing to rumours that Zarafe's people were waiting for me at the north of Lake Chilwa, it was impossible to get a single carrier. Chechikweyo did not assist me in the least, and I was obliged to destroy and leave behind six bags of "mapiri";† I then pushed on, my armed Atonga cheerfully carrying as much as they could

* Alternating with the word "Namaramba."

† Durrha corn.—H.H.J.


ZARAFE'S COUNTRY
Mangoche Mts
Lupende R.
Lipenbegwe Hill
Chenapulu
Chechembere
CHENAPULU'S COUNTRY
L. CHIUTA
Marawa Swamp
Chematope
Chenataka
Chemfula
Chemgokwe
CHEMGOKWE'S COUNTRY
NAMARAMBA
Chemasinga
Sketch Map of Route from CHIKALA TO LUJENDE BY Robert Codrington.
SCALE OF MILES
1 : 500,000 or 1 inch = 7.9 miles
Route .....
Mlinde Hills
CHECHIKWEYO'S COUNTRY
RIVER LUSULO, NAMARAMBA
Chekalange
Mtelasi R.
Munde
Chechikweyo
Lifunu R.
Chiuta L.
Nachimbwe
Chemtogolawamba
Nafisi
NACHIMBWE'S COUNTRY
Mikobo R.
Ntoradenga Swamp
Namwasi
Panakatope
Miloto
to Zarafe
Ngande R.
Nambasi R.
Chenapuri
Pampunundo
to Kawinga's & coast
Milembwe
Naminga R.
Madziabango
to Mkanyela
Dry Bed of Lake
Simulu R.
Chikala (Kawinga's)
Fort
Mposa
Open Water
LAKE CHILWA

manage, having first of all had an angry interview with Chechikweyo, whom I found all along most unreasonable, and at times overbearing and insolent. After I had gone 5 miles, a messenger caught me up, saying that Chendali, the chief's heir, was coming to help me to Nachimbwe's, where I should be able to obtain men, and he soon afterwards arrived, bringing a great number of men, whom I refused to take. Whilst I was resting more men came up, bringing flour and goats from Chechikweyo. These I refused, and sent all the men back, but Chendali and some others followed me to Nachimbwe's. There was some further difficulty at Nachimbwe's about carriers, but the chief behaved very well and ordered his men out, although afterwards some threw down their loads and ran away.

I arrived at Panakatope on the 16th, and on the 17th marched to the Naminga river, 36 miles, and on the 18th to Chikala. Before reaching Madziabango, which is the south-east boundary of Zarafe's country, a fresh camp was seen of some forty men, and again at Pampumundo wells, which were visited for water. People ran away at our approach. As my carriers were unreliable, I kept my caravan as much as possible in the open plain, and reached Chikala without hindrance, although I am under the impression that my movements were watched. All the chiefs except Chechikweyo appeared pleased to have a powerful friend, and I was everywhere received with the greatest cordiality and overwhelmed with presents. Nachimbwe, who, although a vassal of Chechikweyo's, is a powerful chief of a most loyal character, was especially cordial, and on my return had a flotilla of canoes waiting to take me across the river to dodge Zarafe's people at Madziabango. These I declined to accept, as I was unwilling to get mixed up in the swamps, and was in a hurry to get back. The people appear very poor, have very few goats and no cattle. The chief crops appear to be casava and semsen (Yao, "mkwiwa"), which are unaffected by locusts, of which there were many about, and which are said to have caused much famine for many years. The houses were wretched, and my general impression of the people is that they are lazier even than other Yaos, and the reverse of warlike. They spoke of war brought to them some years ago by Angoni, when they took to their houses in the river, which they are preparing now for an emergency. No European appears to have gone beyond Chechikweyo's, and they knew very little or nothing of the Portuguese except as the white men at the coast.

RECENT DISCOVERIES IN THE BASIN OF THE RIVER MADRE DE DIOS (BOLIVIA AND PERU).

By CLEMENTS R. MARKHAM, C.B., F.R.S.

Two Bolivian expeditions and a Peruvian expedition have recently extended our knowledge of the navigable part of the great river Madre de Dios, a principal tribute of the Beni, draining the forests of Paucartambo, and the portion of the eastern cordillera of the Andes in the department of Cuzco, in Peru.

The previous history of the exploration of the river basins of the Beni and Madre de Dios (Amaru-mayu) was given in a paper read on April 9, 1883 (*Proceedings*, N.S., vol. v. p. 313), introductory to the narrative of the exploration of the Beni in 1880–81 by Dr. Edwin R. Heath. An account of the subsequent voyage of Fray Nicolas Armentia in 1884 down the Beni, and up the river Madre de Dios for about 200 miles, was communicated to the Society by our Honorary Corresponding Member, Don Manuel V. Ballivian of La Paz, and appeared in the number of our *Proceedings* for March, 1891 (vol. xiii. N.S. p. 185).

Dr. Edwin Heath and Señor Ballivian have now forwarded to us a letter from Colonel Pando to Father Nicolas Armentia, dated April 26, 1893, and an official pamphlet * containing the report of Dr. Ramon Paz, who led an expedition up the river Madre de Dios in 1894.

Colonel José Manuel Pando, with an engineer named Muller and several young Bolivian volunteers, set out to explore the river Madre de Dios in October, 1892. He was supplied with compass, sextant, and chronometer, and corrected his traverse-survey by daily observations of the sun. After some useful preliminary work on the Beni, Colonel Pando commenced the exploration of the Madre de Dios, in a steam-launch belonging to Messrs. Roca Brothers, on February 2, 1893. But the engine broke down, and they had to continue their course in three canoes. A large affluent on the right bank, in 12° 24′ S. and 73° 47′ W. (of Greenwich), was named after Dr. Edwin Heath. Here Colonel Pando formed a camp of seven men, under his assistant Ibarra. The engineer Muller proceeded to explore the river Heath in a canoe, and the colonel himself continued the discovery of the main stream of the Madre de Dios. He passed numerous picturesque islands rising high out of the water, and a large tributary on the left bank was named after Lieut. Gibbon, U.S.N. At length the mouth of the river Inambari was reached in 12° 42′ S. and 74° 23′ W. (of Greenwich). The width at the mouth was 325 yards, and the depth over 15 fathoms. The Madre de Dios continued in a north-west direction, flowing from the Andes, distant about a

* 'Ministerio de Gobierno y Colonizacion. De Riberalta al Inambari, Informe del Doctor Ramon Paz, Jefe de la Expedicion' (La Paz, 1895).

hundred miles, clear, majestic, and full of islands. The Inambari has a sinuous course, coming from the south-west, and receives many tributaries, among them a river named the D'Orbigny, the mouth of which is in 13° S. and 74° 34' W. (Greenwich).

Colonel Pando returned to his camp at the mouth of the river Heath, and on March 26, 1893, he set out on a most adventurous journey overland, from the encampment at the confluence of the Heath and Madre de Dios to the Madidi. His way was through dense forest, and he relied solely on his gun for food. The party safely reached Ixiama, by descending the Madidi, on April 20, whence he addressed the letter to Father Armentia at La Paz, a copy of which we have now received through the kindness of our Honorary Corresponding Member, Dr. Edwin R. Heath, of Kansas City. Colonel Pando, who is a scientific surveyor, deserves high credit for the able and resolute way in which he achieved this very interesting and important piece of geographical discovery.

Dr. Ramon Paz was sent to take formal possession of the region newly discovered by Colonel Pando. He was accompanied by three officers of the Bolivian topographical department, a naturalist, and an escort of ten soldiers. The expedition embarked on board a steam-launch built by Messrs. Cochrane of Birkenhead, 58 feet long by 13, and 10 feet depth of hold, drawing 1 foot when unloaded, and 3 feet with cargo. She is propelled by a stern wheel, and fuel was obtained, when necessary, from the forest on the river-banks.

Carmen is a settlement on the Beni, above the confluence of the Madre de Dios, which may be considered as the port for the latter river basin. Its district contains a population of about a thousand souls, and has an annual yield of 225,000 lbs. of india-rubber. The expedition under Dr. Ramon Paz left Carmen on April 10, 1894, and entered the Madre de Dios. The ascent was successfully made beyond the furthest point previously reached by Armentia, and the explorers had the satisfaction of arriving at the confluence of the great river Inambari, which drains the Peruvian province of Caravaya. This confluence had been previously discovered by Colonel Pando. The headwaters of the Inambari are famous for their rich gold-washings, and their sources are in the forests yielding the most valuable kinds of quinine-yielding chinchona trees. The return down stream to Carmen was performed without difficulty in two days. The river Madre de Dios is broad and easily navigable, but full of islands. Commencing from the Beni, as many as sixty-three islands received the names of those who have been connected with the exploration of the basin of the Madre de Dios, such as Bovo de Revello, Maldonado, Terrazas, Cardenas, Markham, Church, Ballivian, Campero, Pando, etc. On the upper part of the river's course the shores are lined with cliffs of considerable height. There are numerous affluents, but only two of considerable size, the Heath and the Inambari. The main stream of the Madre de Dios

averages a width of from half a mile to a mile, its volume being nearly double that of the Beni at the junction. The current was found to be flowing at the rate of 3 miles an hour. The rate of the launch in descending was 7 knots, which, added to the 3 miles current, make 10 knots an hour during forty-four hours. Dr. Ramon Paz describes the flowers of the river-bank vegetation as beautiful beyond words, and supplies of game and fowl were abundant. Carmen is placed in 11° 57′ S. and 73° W.

The wild tribes met with on the Madre de Dios are the Araonas, Pacaguaras, Caripunas, Toromonas, and Guarayos, which are all described in the 'List of Tribes in the Valley of the Amazon,' published by the Anthropological Society in the present year. Dr. Ramon Paz supplies a short vocabulary of the Araona language.

A Peruvian expedition has also descended the Madre de Dios from its sources in the Andes, arriving at Carmen on the Beni in September, 1894. It was commanded by Don Carlos Fermin Fiscarrald, whose companions were two Peruvians named Zorrilla and Sarria; Mr. Charles Alfred Cockburn, an Englishman; and thirty men. They had ascended the Ucayali from the Amazon, and the Urubamba to the point where it receives the Camisea. Up to this point the whole river system is navigable by steamers. The Camisea is only suited for canoes. The explorers ascended it, crossed the ridge, and went down a stream called the Terjali, which conducted them to the river Manu. The passage of the ridge, dividing these streams, only occupied them fifty-five minutes. Here they constructed a large canoe 65 feet long and nearly 5 feet in width. While they were thus occupied, an advanced party of eight of their men was attacked by the Chunchos Indians of the Paucartambo forests, and one man was killed by their arrows.

As soon as the canoe was finished, they descended the Manu to its junction with the Piñi-piñi, where the combined streams take the name of Madre de Dios. From that point they reached the mouth of the Inambari in six days, and thence descended the river to Carmen on the Beni. Señor Fiscarrald is an enterprising merchant, who has established a station on the Ucayali, at the junction of the rivers Tambo and Urubamba, and employs twenty boats in collecting produce for export. His discovery of an easy and short route between the basins of the Ucayali and the Madeira is not only of geographical interest; it will lead to great commercial results. The Madre de Dios is found to be a magnificent river without obstructions, and the region it traverses is one of the richest in the world. The slopes of the Andes yield coffee and cacao of unequalled excellence; they are the home of the best species of quinine-yielding chinchona trees, and they abound in gold. In the lower forests there are inexhaustible supplies of india-rubber of the best quality, and many other valuable products.

Our Honorary Corresponding member, Señor Ballivian, has been most

diligent in furnishing us with geographical information of great value, and the Society has again to thank him for the present interesting communication. The Society is also indebted to our other Honorary Corresponding Member, Dr. Edwin R. Heath, for transmitting a copy of Colonel Pando's important letter.

PROFESSOR RAMSAY'S WORK ON PHRYGIA.—REVIEW.*

By Sir CHARLES W. WILSON, K.C.B., K.C.M.G., etc.

Prof. Ramsay's important work on Phrygia is dedicated to the supporters of the Asia Minor Exploration Fund, amongst whom the Royal Geographical Society has ever been prominent. The liberal contributions of the Society have been more than justified, for rarely in the history of exploration has so much been accomplished at such small cost. It is almost impossible to exaggerate the value, to students of historical geography, of the results obtained by Prof. Ramsay, Mr. Hogarth, and the gentlemen who have either accompanied them or followed in their footsteps. A flood of light has been thrown on the history and geography of Asia Minor; on the art, social life, commercial relations, and religious customs of the various races that have inhabited the country; on the status of Christians and the Church in the Provinces under the Roman emperors; and on the changing fortunes of the long struggle that ended in the triumph of the crescent and supremacy of the Turk.

Prof. Ramsay has published many of the results of his labours in his 'Historical Geography of Asia Minor'—a work issued by this Society as one of its Supplementary Papers, and in numerous communications to the Hellenic and other societies. But these must, in some sense, be regarded as introductory to the greater work which he has always had in view, and of which the present volume is a first instalment. His scheme has been to make an absolutely fresh work founded on the ancient authorities alone, in which the geographical situation, the natural surroundings, and the commercial advantages of each city should be set forth in an account of its history. As geographers, we may regret that he has adopted the plan of a 'local history.' We lose the broad generalization which is of such importance to geographical science, but we have in its place well-drawn pictures of local life and scenery, and we must allow that an historian of Phrygia would have found any other course beset with difficulties.

In accordance with his scheme, Prof. Ramsay has parcelled out Phrygia into districts, and his intimate knowledge of the country has enabled him to bring clearly before us the influence that geographical

* 'The Cities and Bishoprics of Phrygia.' By W. M. Ramsay, D.C.L., LL.D., etc. Vol. i. ("The Lycos Valley and South-Western Phrygia"). Clarendon Press. 1895.

position and topographical environment have had upon the social and political condition of the inhabitants of the various towns and localities which he describes.

The first volume opens with a general description of the Lycos valley, its scenery, its ethnology, and its history. Through the valley ran the "Eastern Highway," which, under Roman administration, was one of the most important thoroughfares in the empire; and in it were situated large towns, such as the Lydian Hierapolis, the Phrygian Colossai, the Carian Attouda, the Seleucid Laodiceia, and the Pergamenian Tripolis. In the diffusion of Christianity the valley played a prominent part, and in after-ages it was the scene of constant fighting between the Byzantines and the Seljûk Turks. As the nomads spread over the valley, the population decreased, and the land passed out of cultivation. Hierapolis was deserted, the Laodiceans moved to Denizli, the Colossians to Khonai, and the Trapezopolitans to Kadi Keui; and their descendants, partly Christian, partly Moslem, may still be found in those places. There has been little mixture of race; neighbouring villages remain distinct from each other in blood and in manners, and some of the customs have possibly been handed down from Phrygian, Seleucid, or Pergamenian ancestors. A pagan god or Christian saint appears as a Moslem *dede* or heroized ancestor; a Christian bishoprick succeeds to the priesthood of an old *hieron;* and a place of pilgrimage sometimes turns out to have been a noted shrine of Artemis or Sabazios.

A very full account is given of Laodiceia, a city founded by Antiochus II. to strengthen the hold of the Seleucid monarchy on the country, and partly peopled by Syrians. Under the Roman emperors it was one of the richest cities in Asia, a centre of banking and financial transactions, and a manufacturing town noted for its fine cloth, its carpets, and its various kinds of garments. These features, as Professor Ramsay points out, are referred to in the letter to the Church of the Laodiceans (Rev. iii. 14–18). Amongst the many interesting remains of the old town are those connected with the water-supply, including an inverted stone syphon, similar in construction to the syphons at Patara, and near Jerusalem, by which the water was carried across a valley. A sketch is given of the great Zenonid family, one of whom, M. Antonius Polemo, "addressed cities as his inferiors, emperors as by no means his superiors, and the gods as his equals." Many curious details will be found respecting the religion, games, and dress of the people, and of the various officials and municipal authorities who managed the affairs of the city.

In describing Hierapolis, the "Holy City," special attention is naturally drawn to its religious character, and to the hot springs whose remarkable deposits are visible from nearly every point in the valley. Professor Ramsay makes a happy suggestion that the Ploutonion—a hole reaching deep into the earth, from which issued a mephitic vapour

—was deliberately filled up and covered over by Christians, who believed it to be the very dwelling-place of Satan. Equally happy is the view that the "Brotherhood of Youths," mentioned by Ibn Batuta, had its origin in the *Xenoi Tekmoreioi*, or "Guest-friends who use the sign." The trade guilds, mentioned in the inscriptions of Hierapolis, date from a very early period of history, and have survived to the present day, especially amongst the Armenian population of Asia Minor.

One of the most interesting chapters is that dealing with the cities in the Middle Mæander valley. In this, one of the richest districts of the interior, fifteen cities, towns and villages, are now placed, where only one was known before. The inscriptions found here have supplied much new and valuable information on the social life of the people before they were completely Hellenized, and on the habits and customs of the priests and other persons who lived in the sacred villages near the great *hiera* of Asia Minor. In connection with the sacred animals, attention is called to the fact that they were the animals of a pastoral people, and that all, excepting the sheep, appear in the Hittite hieroglyphs. From this latter fact, Prof. Ramsay infers that the hieroglyphs originated in the vast level, treeless plains of Asia Minor. He has also adopted the view that Khitasar, the Hittite monarch who fought with Rameses II., was the ruler of a great empire, having its capital at Pteria. This view will probably turn out to be correct when the mounds of Northern Syria have been excavated, and more light is thrown on the Hittites and their empire.

It is interesting to find that so many traces of the old village system, as described in the text, have survived to the present day. Each village has still, in some measure, its separate individuality and administration; and its own territory held to a large extent under the communal system. Many of the more valuable inscriptions have been found in the obscurer districts of Asia Minor, and some of those of the Middle Mæander valley have supplied a word that has a peculiar interest in connection with the letters of Ignatius.

After noticing the Phrygian cities of the Lower Mæander valley, Prof. Ramsay describes Colossai, which in early times was the great city of the Lycos valley. Colossai gradually declined as Laodiceia rose to importance; and the stories of the gradual removal of the Colossians to Khonai, on a lofty spur of Latmos, and of the destruction of the great church of St. Michael by Seljûk Turks under the leadership of a Greek renegade, are well told. The questions connected with the accuracy of Herodotus' description of the Lycos gorge, which were discussed in the author's 'Church in the Roman Empire,' are again briefly noticed. There is no reason to believe that the Lycos ever flowed for five stadia in an underground channel in the immediate vicinity of Colossai; and the explanation given that the real source of the river is in Lake Anava, whence it runs underground to Kodja Bash, appears to

be correct. In connection with Colossai, there are good descriptions of the old Eastern Highway, and of the later Byzantine road to the east, which, instead of following the old road to Apameia, turned north to the Mæander valley, near Siblia, and crossed the hills beyond it by the *Duz Bel.*

Some of the most interesting passages in the book are those that relate to the imperial estates in the Killanian plain. These estates were farmed to contractors, and were managed by a procurator who was an imperial freedman, and managers who were imperial slaves. The land was cultivated by the natives, who paid rent for their farms. The procurator, who represented the imperial authority, maintained public order by a corps of police, and marked and preserved the boundaries of the properties. The estates appear to have belonged to the Pergamenian kings, from whom they passed to the Roman emperors. At a later period they came into the hands of a branch of the imperial family, and they seem to have been owned by the Annia Faustina who married the Emperor Elagabalus.

It may be added that each chapter of Prof. Ramsay's book is followed by appendices, containing the more important inscriptions in the district described, lists of the bishops, and discussions on disputed points. There is also a clear map, showing the natural features and the ancient sites in South-Western Phrygia. In transliterating Turkish words, the adoption of the French form *dj* for *j*, and *tch* for *ch*, is, we think, to be regretted.

Prof. Ramsay's 'Local History of Phrygia' will, we venture to think, when completed, be the most important work of the kind that has been published in this country in recent times; and the thanks of geographers and scholars alike are due to the delegates of the Clarendon Press for undertaking its publication.

M. MARCEL DUBOIS ON COLONIAL SYSTEMS AND COLONIZING PEOPLES.*

By G. G. CHISHOLM, M.A., B.Sc.

THIS work is in a large measure avowedly polemical. It is called forth by the author's conviction of the erroneous nature of some of the views expressed, more particularly of M. P. Leroy-Beaulieu in his 'History of Modern Colonization,' as well as of Seeley and his French translator M. Rambaud. M. Dubois wishes especially to protest against the current belief that the French are not a colonizing nation, and that their failure is due, like that of many other nations, to the inferiority of their methods as compared with the liberal policy to which England owes her success

* 'Systèmes Coloniaux et Peuples Colonisateurs. Dogmes et Faits.' Paris: G. Masson, 1895.

in colonization. M. Dubois maintains, on the contrary, that the French are eminently a colonial people; that they have even found out the mode of expansion truly useful to their country and truly moral (*vraiment moral*); and as regards the liberality of the English policy—held up, he says, especially by some of his own countrymen as an example to the French—he asserts that such liberality as England has shown was forced upon her by circumstances, and that, historically, the French were in advance of the English in the application of liberal ideas to colonial management. Originally, English colonization was carried out from exactly the same motive as that which animated other countries—the desire to secure a monopoly of trade. Self-government was granted to some of our colonies only to avoid a similar secession to that by which we lost the United States.

These and other ideas are developed in a series of chapters in which a sketch is given of the colonizing efforts of all the leading colonial nations of modern times, beginning with Portugal. The territorial expansion of Russia is treated from the same point of view in one chapter, and that of the United States in another headed "Colonies of Colonies." These chapters are all very interesting, and are crowded with just remarks, though a good deal is demonstrated with somewhat of the air of discovery that is pretty obvious to all students of colonial history.

We are glad to see that this volume is only a preliminary survey of the question, issued now because the author believes that a protest against current ideas is urgently required, and that he hopes afterwards to present the results of his studies to the public in a more rigorous form, in which his theses shall be supported by documents and proofs. That being so, it may be of use to direct attention to certain oversights or doubtful statements that it would be well to examine before the more extended work is issued. Perhaps the most curious of the oversights is the enumeration (p. 118) of the Channel Islands among the annexations of England between the peace of Utrecht and 1815. In the Channel Islands it is not forgotten that such annexation as there was took place the other way and at a much earlier date.

That, however, will mislead no one; but there are some other statements that require more attention. M. Dubois again and again insists that the population of the United States is not English in origin in so large a proportion as we are apt to suppose. On p. 108 he says that down to 1640, when emigration was arrested or slackened in consequence of the cessation of religious persecution in England, only from 25,000 to 30,000 exiles crossed the Atlantic, and that, as in 1660 there were nearly 200,000 Europeans in the American colonies, it may be assumed (*il est permis de croire*) that the English then did not form the majority, but that already they were becoming fused with Irish, Dutch, Swedes, and French into a new family. We hope that in the more extended work the grounds for this assumption will be given.

Speaking of New England only, Seeley ('Expansion of England,' p. 71), citing Hildreth's 'History of the United States,' states that the immigrants to that region down to 1640 were not more than 25,000, and that after that date the immigration was balanced by emigration "or dispersion"; but he adds that from these 25,000 are derived not less, perhaps, than one-fourth of the present population of the United States, leaving us to suppose that the net gain from the early immigration into the American colonies from all quarters subsequent to 1640 did not count for much. But Charles Davenant, one of the most careful statistical investigators of the seventeenth century, writing in 1698, states that for the past eighty years the plantations are admitted to have carried away in ordinary years about 1000 persons. He is estimating the loss of England alone by emigration, and if there is any truth in this estimate, it should be taken into account in such calculations.

Further on (p. 117) M. Dubois states in a note that the great stream of emigration to the United States, begun in 1815, has not been exclusively English. That, of course, is quite true, even if English be taken to include Irish; but M. Dubois adds the extraordinary and of course utterly erroneous statement, that between 1821 and 1881 the number of Italians that went to the United States was three times as great as that of the English. Again, speaking of the concentration of the population of the United States in towns, M. Dubois (p. 200) states that in Illinois, Chicago absorbs the whole of the increase of the population. Well, it is true that between 1880 and 1890 the great bulk of the increase of the state of Illinois belonged to Chicago, but the very rough way of stating this adopted by M. Dubois conceals facts worthy of careful consideration. The truth is, that during the same period the increase of population in Illinois, apart from Chicago, was about 150,000 on a total initial population of 2,575,000, equal to an annual increase of 5·7 per 1000, more than three times the rate for the same period in France, urban and rural population included.

DR. SVEN HEDIN IN CENTRAL ASIA.*

[The following has been received from Dr. Sven Hedin, under date "Kashgar, October 20, 1895."]

I will briefly relate my proceedings during the past summer. On July 10, I started *viâ* the village of Upale to the Ulug-art pass over the Kashgar range (Mustag), which proved the most difficult of all the passes that I know. Water boiled at 83·69° C. (172·66° Fahr.), with an air-temperature of 1·8° (35° Fahr.), snow falling at the time. It is not the altitude, but the nature of the ground which makes the pass so

* A further long communication has been received from Dr. Hedin, which will be published in an early number.

difficult; both slopes are excessively steep and abrupt, especially that to the west, which resembles a rocky ladder covered with snow. All the goods were carried by Kirghiz, in spite of which we had the greatest difficulty in getting our horses across, and lost one, which fell down a precipice. On the other side, to the left of the pass, there is a fine glacier, which has closed up three small valleys on the right, and thus brought about the formation of three small but picturesque lakes with green water. We afterwards proceeded to the Kirghiz *aouls* of Mutji, a place in the northern part of the great valley of Sarik-kol, and not far, in a southerly direction, from the Kara-art pass, which forms the watershed between the Sarik-kol and Markan-su.

I then turned towards the south, in order to make a thorough study of the lake of Tiaker-aguil, which is placed almost opposite the beginning of the narrow valley of Gez. The lake is situated at the mouth of a valley, which has apparently been blocked up by the dust and sand, which is transported in large quantities by the east winds which blow up the valley of Gez. My intention was to examine the glaciers which exist in the chain of mountains between Gez and Mustag-ata, but the weather was so unfavourable that any ascent was out of the question. Even in the valley of Sarik-kol there was incessant snow and rain. We therefore continued southwards by Kara-kul and Ulug-rabat to Tagarma. Mustag-ata disappeared in the clouds, and became covered with snow down to its base. The climate was entirely different from that of the previous year.

At Tash-kurgan I had the pleasure of meeting Mr. Macartney, and we visited the village and fortress together. These had been shattered by the violent earthquake shocks which assailed these parts from the 5th to the 20th of July. The most powerful shock took place on the 5th, and was accompanied by tremendous reports. All the inhabitants (stationary Tajiks), as well as the Chinese workmen, remained in tents and *yurts*. Not only were the constructions of man ruined by this earthquake, but even the mountains felt the effects. When I subsequently passed by the narrow valley of Shindeh, I was able to observe how this passage, which is enclosed here and there by perpendicular rocks, was filled with enormous blocks and *débris*, amongst which it was necessary to thread one's way. The road between Ilik-su ("Tepid water;" not Ili-su, as Younghusband writes it) and the Raskan-darya had suffered in like manner, and, according to the Tajiks, it was only possible to pass on foot.

In company with Mr. Macartney, I proceeded *viâ* Iergal and Defter to Shojet-bai, where the river of Shunserab unites with that of Kara-tiukur to form the Tagdumbash-darya. Then I visited the sources of the Shunserab in the elevated valleys of Uprang, Ulug-tur, Shunserab, Kara-su, and Ilik-su; and in order to determine the altitudes and make some geological observations, I ascended the three passes of Shunserab,

Uprang, and Ilik-su. I have not time to write now on the observations which I made. Thence I took the road by Kara-tiukur, and crossed the pass of Vakjir, in the vicinity of which, especially from the faces of the great glaciers of the Hindu-Kush, lie the sources or true origin of the Amu-darya. Nevertheless, the Tiakmakden-kul is generally regarded as the source of the Amu. In fact, there is a small valley, Chil-ab, on the south-west side of the lake, whose stream bifurcates in such a way that half the water flows to the Tiakmakden-kul, and the other half to the Penj. But certainly the most important streams—that is to say, the Penj and its tributaries, especially that of Vakjir—ought to be considered the true source, particularly as the altitude from which they spring is almost double that of the Tiakmakden-kul.

On my descent of the valley of the Upper Aksu, I passed the mouth of the small valley of Mehmaniolli, where the Commission for the delimitation of the frontier was encamped at the moment. Thanks to the boundless hospitality of the two commanders, Messrs. Gerard and Pavalo-Shveikovsky, I remained there three weeks. The most friendly and cordial relations possible existed between the two camps. Colonel Holdich and I made an appointment at the R.G.S. for this time next year.

I made an interesting journey back to Kashgar from Tash-kurgan. I followed the route across the chains of mountains which form the geographical frontier of the Pamir plateaux, and thus crossed the passes of Beldir, Kandahar, and Arpa-tallak. Having also crossed that of Shindeh, I have been able to draw a geological section of all the chains bordering on the Pamir. The route is very difficult, especially the passage of the Raskan-darya, or river of Tong (the upper Yarkand-darya), which is a large stream even at this season. At Tong the rapidity of the current is such that the river can with difficulty be crossed, with the help of inflated goat-skins (*tulums*). From Tash-kurgan to the foot of the mountains the population is exclusively composed of Tajiks. Nevertheless, it is curious that geographical names in the Turki language are by no means rare. From Kusherab, where the Yarkand-darya is once more crossed, I made my way direct to Kashgar by way of Yangi-hissar.

Now, having finished the description of my journey in the desert, I am engaged in preparations for that towards the East. I shall send my caravan hence to Kizil, whilst I shall go myself once more to Urdan Padishah to examine the small mountains which are found between that place and Kizil. Then I shall take the main road to Khotan, whence it is my intention to make an excursion to the Mazar-Tag. If time should permit, I should like to attempt the discovery of the ruins of an ancient town which, according to information received, is to be found at some days' journey from the river in the direction of the Keria-darya. We do not know much of the plateaux of Northern Tibet, south of the

Kuenlun, and between the meridians of Lob-nor and Keria. Both General Pievtsof and Captain Grombchevsky experienced great difficulties there. I will make an attempt to penetrate in that direction during the winter, perhaps the only season in which a visit to these arid countries is possible. Thence I hope to return to Lob-nor to examine the swamp and its neighbourhood. There I shall do my best to obtain information as to the Littledale expedition, of which I have not heard since its departure for Cherchen.

For the journey to China proper, I shall probably proceed by way of Mongolia. I hope *en route* to have an opportunity of collecting some information concerning the revolt of the Dungans. The cause of this rebellion is uncertain, though it much resembles the former one (*vide* Letter of Baron v. Richthofen, No. vi., 'On the rebellion in Kansu and Shensi.' Shanghai, 1872). Nevertheless, it would not be surprising if the Mohammedans were still bolder this time, owing to the Chinese misfortunes, and the weakening of their forces since the war. Even here at Kashgar we have experience of the efforts made by the Chinese. Not long ago the greater part of the garrison of the place was despatched to Aksu, to be sent on to Kansu, the seat of the war. Daotai himself has announced that the revolt is approaching these regions, and that the insurgents mean to invade Turkestan by way of Aksu and Khotan, and also (it seems) by Lob-nor and the Tarim.

THE MONTHLY RECORD.

THE SOCIETY.

Mr. St. George Littledale.—Mr. and Mrs. Littledale have arrived in England, and we are glad to learn that Mrs. Littledale's health is not so bad as was feared; with due care it is hoped she will soon be quite strong again. Mr. Littledale will give an account of his remarkable journey across Tibet, to within 40 miles of Lhasa, at the meeting of the Society on Monday, February 24. He has brought home a detailed map in many sheets, constructed day by day from his own observations, often under conditions of the most trying kind.

EUROPE.

Lakes in the Basin of the Lech.—A contribution by Dr. W. Halbfass to *Pet. Mitt.*, No. X., 1895, contains the results of a number of observations made by him as to the depth, temperature, and transparency of a number of lakes in Bavaria and the Tirol in the basin of the Lech. In the table below, which may be compared with that relating to the English Lakes on p. 162 of vol. vi. of the *Journal*, the dimensions of the principal lakes on which observations were made are given in English measures:—

Name.	Greatest Length.	Greatest Breadth.	Circumference.	Depth in feet.		Height of lake-surface above sea.	Area. Square miles.	Volume. Million cubic feet.
	Miles.	Miles.	Miles.	Maximum.	Average.	Feet.		
Bannwaldsee	—	—	—	37·7	21·0*	2598	0·81	475
Hopfensee ...	1·61	1·04	4·19	36·4	17·7	2608	0·68	336
Weissensee	1·78	0·57	3·67	82·0	44·3	2615	0·50	615
Alpsee ...	1·40	0·60	2·92	193·6	84·6	2662	0·45	1056
Haldensee ...	1·17	0·55	2·33	68·9	47·2	3688	0·37	484
Vilsalpsee ...	1·17	0·48	2·17	88·6	47·9	3832	0·27	364

Finland.—A volume entitled, 'Exposé des Travaux Géographiques exécutés en Finlande jusqu'en 1895' (Helsingfors, 1895), consisting of 154 pages, was prepared as a communication to the Sixth International Geographical Congress (London, August, 1895). It is composed of a series of sections by different writers, giving a brief account of the works connected with the geodesy and astronomical geography, cartography, topography, geology, hydrography (both of the coasts and the interior), meteorology, terrestrial magnetism, botanical geography, zoological geography, phænology, statistics, industrial and commercial geography, historical and ethnographical geography, and ethnology of Finland, preceded by an introduction relating to the general treatises on the geography of that country. The topographical survey of Finland has been in progress since 1870, at the expense of the Russian government, to which, however, the government of Finland decided in 1886 to contribute an annual subvention of 29,000 marks for fifteen years. In 1895 the survey of the country south of 61° 6′ N. was completed, with the exception of the sheets to the south of Keksholm and the region adjoining Lake Ladoga, and the thirteen sheets between Villmanstrand and Keksholm from the parallel of 60° 54′ to that of 61° 6′ N. Under the head of hydrography a list of the canals of Finland is given, with the dates of their construction, and in some cases the depth of the locks. Under that of industrial and commercial geography, a few paragraphs are devoted to the rapid growth of the dairy industry, and the consequent increase in the export of butter in recent years, especially since the introduction of centrifugal machines and separators. The development of the export trade has been particularly rapid at Hangö since 1887, when a large ice-breaker was brought into use to keep the traffic constantly open in winter. The total export of butter from Finland increased pretty steadily from 5·5 millions of kilos. in 1886 to 9·6 millions in 1893, and then suddenly rose to 13·3 millions in 1894, and of this total the proportion exported by way of Hangö increased from 12·9 per cent. in 1886 to 84·9 per cent. in 1894.

ASIA.

Prince Henry of Orlean's Journey from the Mekong to Assam.—General J. T. Walker communicates the following note on this subject:—The *Times* correspondent in Calcutta gives the following account of this journey: "Further particulars of Prince Henry of Orlean's journey show that 1600 miles of new country have been traversed. The source of the Irawadi has been fixed about 30 miles north of lat. 28°, between long. 98° and 99°. The main stream is known locally as the Taurong, which becomes the Hmaikha of British geographers. Eleven streams in all drain from the mountain range south of Tibet, three of which are longer than

* Estimate.

the others; the Taurong, which is the longest, with most water, lies farthest east. The valleys of the Mekong, the Salween, and the Taurong are separated by high ranges, which prevent any possible connection, each flowing separately on its course. The prince and his two companions crossed seventeen ranges between Tsikon, on the Upper Mekong, and Sadiya, in Assam. Some of these were 13,000 feet high, while the adjacent ranges showed peaks much higher. The party, which originally started from Tongking, left Ta-li-fu in the middle of June, and reached Tsikon early in September, the Khamti country at the end of November, and Sadiya at Christmas. It had no escort throughout, and no collision with wild tribes occurred. The route was most difficult from Tsikon, a coolie transport having to be employed." From the above account it is obvious that Prince Henry has made a most notable journey, and has probably solved the riddle whether the Lu river of Tibet is the source of the Irawadi or of the Salwin. It is said that the source of the Irawadi has been fixed in lat. 28°–30°, between long. 98° and 99°; that this is the longest and easternmost of the streams flowing into the Irawadi from the mountain range south of Tibet; and that it is locally known as the Taurong, and enters Eastern Burma under the name of the Meh Kha. The source of this river is shown exactly as here described in the map attached to the *Proceedings of the Geographical Society* for June, 1887; but lower down it is made to join the Lu river of Tibet at Chamutong, and then trend south-westwards into the Meh Kha. But if the Taurong is the principal source of the Irawadi, it cannot be an affluent of the Lu river, and must be the upper source of the Fungmai river, which lower down becomes the Meh Kha; in this case the Lu river must be the source of the Salwin. Full information on this subject will doubtless be forthcoming when the details of Prince Henry's journey are published. The circumstance that the hill ranges between Tsikon, on the Upper Mekong, and the Khamti country should have been traversed without any escort, or any collision with the wild tribes occupying them, is very remarkable, being quite the reverse of the experience of the travellers who have hitherto attempted to make the same journey, but in the opposite direction. It is highly creditable to Prince Henry, as a judicious traveller through regions occupied by barbarous tribes, whom it is essentially necessary to make friends of and conciliate.

Navigation of the Mekong.—Repeated attempts have been made by the French in recent years to overcome those obstructions to navigation which induced Francis Garnier, on his return journey from the expedition of 1866–68, to pronounce the Mekong useless as a waterway. These obstructions consist in difficult rapids from Sambok to Sambor above Kratie, a series of impassable cataracts below Khon in about 14° N., and another series of dangerous rapids extending over a stretch of about 50 miles below Kemmarat. Above these the river forms an excellent waterway as far as Nongkai, and sometimes even to Viengshan, where it issues from the calcareous mountains that cover the north of Indo-China. The 44th number of *Le Tour du Monde*, 1895 (November 2), gives an account of the progress recently made in surmounting these obstructions. In 1889, M. Heurtel, frigate captain, took the first sea-going vessels up to the falls of Khon. In 1893 steps were taken to transport vessels to the navigable waters above these falls by means of a railway through the island of Khon, and before the close of the year the transport of the *Ham-Luong* and the gunboat *Massie* was successfully accomplished. In February, 1894, the *Massie* managed with great difficulty to steam up the rapids of Kemmarat, six days being required for the passage, and on August 15 it reached Viengshan. On September 5, in the same year, the gunboat *La Grandière* was also conveyed across the island of Khon, and in November it also passed the rapids of Kemmarat. Meanwhile Captain Robaglia, in the early part of 1894, made a survey of the Mekong

below the falls of Khon, and ascertained that it could be made navigable all the year round down to Saigon for vessels drawing 6½ feet.

A Journey in Western China.—Mr. A. von Rosthorn, a member of the commission appointed to open the port of Chungking to foreign trade (1891), describes, in a paper read before the Geographical Society of Vienna, a journey which he made in the autumn of the same year, partly over new ground, in the north-west of the province of Szu-chuan. He proceeded from Chungking to Chengtu-fu by the usual route, and thence to Kwan-hsien, at the head of the irrigation works by which the waters of the Min are distributed over the plain of Chengtu-fu. Kwan-hsien was visited by Captain Gill in 1877, when he made what he called a loop in the mountains to the north of the Chengtu-fu plain, as to which he gave out the conjecture that it was formerly the bed of a lake. On this point, according to Von Rosthorn, tradition and history leave no room for doubt. Von Rosthorn first points out that the bifurcation of the Min at Kwan-hsien is clearly artificial. Traditionally, the plain of Chengtu-fu is said to have been at one time a *lu-hai*, which, says Von Rosthorn, can only mean a lake or a swamp. And, further, the Chinese annals of the period of the Chin, the period in which these annals begin to be trustworthy, ascribe the origin of the works by which this lake or swamp was drained to one Li Ping, the first governor of Shu, who entered on his office about 250 B.C. The irrigated plain of Chengtu-fu would thus be, at least, in part upwards of 2000 years old. At Kwan-hsien the new part of Von Rosthorn's journey began, his route being from this point for the most part westerly. The new ground traversed lies to the north-west of a line drawn from Kwan-hsien to Tachien-lu and south of 31° 40′. Most of this region forms the administrative district of Chinchuan, or Moukung, which is separated from that of Wenchuan on the east by the Palang-shan range (altitude of pass about 15,000 feet). The district of Chinchuan is composed of the basin of the river of that name—a Chinese name, meaning "gold-stream," for the upper part of the Tung, or Tatu-ho, known to the tribes of the district as the Chiachu-ho, or the Tsuchin (see map in *Proceedings R.G.S.*, 1886, p. 416; and Baber, 'Travels and Researches,' p. 94). The whole region is composed of mountain ranges with narrow intervening valleys. The prevailing rock is granite, which appears on the surface chiefly in the higher parts; the sides of the valleys, and above all the main valleys, which have a north-to-south trend, being formed principally by precipitous slate formations, which leave little room for cultivation at their base. The native tribes, Tibetan Lamaists, are chiefly found in the side valleys and on the higher parts of the mountains, where they cultivate barley, wheat, and buckwheat up to the height of 12,000 feet. Until the latter part of last century, these tribes were under the rule of independent chiefs; but in 1776 they were conquered by the Chinese, after a war of some years. The Chinese carry on the government in a conciliatory spirit, recognizing the influence of the lamas, and making every effort to secure their favour. They have made many attempts to colonize the region, but with little success. Except in the military posts, which are established beside each of the great lamaseries, the Chinese are found principally as traders, innkeepers, and porters, and hence confined to the main routes in the sparsely inhabited main valleys. Von Rosthorn, it may be mentioned, rejects Baber's name of Hsifan (Sifan) for the tribes of this region, as not being current locally; but it may be pointed out that Baber suggests the name only as "occasionally used," and as having "no very depreciatory meaning" ('Travels and Researches,' p. 93). The name generally used, according to Von Rosthorn, is Man-chia, or Man-jên, which, he says, is free from the objection to which the general term of contempt, Man-tse, applied by Chinese to native tribes generally, is liable, the offensiveness of the latter designation lying wholly in the termination.

Proposed Connection of Assam-Burma Lines.—A fresh expedition, this time from the Indian side, is examining the passes over the Patkoi range between Assam and the Hukong valley, and expects to join the survey party from Mogaung (referred to at p. 93 of the *Journal*) about February 1. The Assam expedition is a large one, consisting in all of about five hundred people, including escort, surveyors, and camp-followers. Their object is to reconnoitre the best route for a connecting-line between Makum and Mogaung, or, in other words, to prepare the way for linking the Assamese and Burmese railway systems. Mr. Way, C.E., is engineer-in-chief, and is assisted by Mr. Wallace and Mr. McIntyre, and Captain Swayne as intelligence officer. Mr. Way has already surveyed other likely routes, and it is said that the Patkoi range offers fewer obstacles than the hills of Manipur and Chittagong, a conclusion which is corroborated by the reports of previous explorers over the Patkoi mountains. The country about here is very unproductive, and inhabited by tribes who have very vague notions of their obligations to the British Government. Everything has to be conveyed by coolies, as roads do not exist, and the jungle paths are difficult and infested with leeches. Three hundred and fifty coolies were collected in Shillong and sent to Margherita (Diheng Bridge), and by November 4 a camp had been pitched on the top of the Patkoi, over 4000 feet high, and, the jungle round having been cleared away, the country below lay revealed like a map. Mr. McIntyre started about the same time to reconnoitre the passes east of the Non-yong lake. It was hoped that in a few days heliographic communication with Sadiya, where there is a telegraphic office, would become possible. In the mean time, the Mogaung column, who appear to have had difficulties with the Kachin tribes, are working their way westward, and news of the junction of the two parties ought to arrive at almost any moment.

AFRICA.

Old Map of Africa.—Dr. Carl Peters has lately issued a pamphlet (Berlin: Dietrich Reimer) describing an old map of Africa found by him in a historical atlas published at Amsterdam between 1705 and 1719, on which he founds a fresh argument in favour of the idea, so often brought forward, that the interior of the continent was definitely known to the Portuguese in the early days of their colonies on the East and West Coasts. The points on which he lays most stress are: (1) that a race of dwarfs, named Bakke Bakke, are shown as inhabiting a forest region north-east of a northern bend of the Congo, as drawn on the map; (2) that the information as to the gold-mines south of the Zambesi coincides remarkably with what is now known of those regions. In view of the unquestioned fact that such gold-mines were worked in very early times, it is by no means improbable that the Portuguese possessed some knowledge of them at the time of their greatest prosperity in Africa; it is also quite possible that some rumours of dwarfs living in a forest region in the interior reached them through other native tribes. But it requires much more definite proof to suppose, as Dr. Peters is inclined to do, that accurate knowledge of the hydrography of Central Africa had been obtained at that date. A common characteristic of the maps of the sixteenth and seventeenth centuries, is that the known features in the vicinity of the coasts are pushed far into the interior, so that we actually find some Abyssinian names closely approaching those belonging to the interior of Angola. This fact goes far to explain the hydrography of the Amsterdam map, which, though wanting the common lake-reservoirs of the Nile and Congo shown by Pigafetta and others, reproduces many of the usual features of those maps. As regards the Congo, it may be pointed out: (1) that the Koanza, quite a second-rate stream, is given an equally remote source in the interior; (2) that the upper course is marked on the map "Coango," and that the town of "Casangi" occupies,

relatively to its left bank, the same position that the modern town of that name does to the Kwango, which would therefore seem to be the stream indicated. Other points which tell against the supposition of accurate knowledge are the avowed uncertainty as to the origin of the Zambesi, and the fact that the lake indicated in the eastern half of the continent is said to be placed merely according to the report of the negroes; also that an important river, coming from the far interior, is made to debouch between Melinde and Mombasa, which shows an equal exaggeration of distance with that noted in the case of the Koanza and Kwango.

Explorations by Officials of the Congo State.—Further details of the explorations of Captain Nilis and Lieut. de la Kéthulle between the Welle and Darfur (*Journal*, vol. v. p. 81) are given in the *Mouvement Géographique*, 1895, No. 24, accompanied by a good map showing their various routes. From this it will be seen that much light has been thrown by these travellers on the hydrography of the regions traversed, especially with regard to the Shinko, a northern tributary of the Mbomu, which was crossed at various points and explored almost up to its sources. The supposed course of the Kotto, the headwaters of which were crossed by the travellers on their march to the confines of Darfur, is also shown on the map. This river, which joins the Welle-Mobangi below the confluence of the Mbomu, will apparently be one of the most important northern tributaries of the stream, having its sources north of 8° N. lat., and thus forming the most northerly extension of the Congo basin. The expedition does not appear to have added much to our knowledge of the headwaters of the Bahr el Fertit, known previously from the scanty information supplied by Colonel Purdy and Dr. Potagos, having only just crossed the watershed before reaching its furthest point. For this section of the journey, however, further details are promised. Some interesting information is given with reference to the political relations of the tribes of this region, and their powerful sultans Bangasso and Rafai, as well as of the invasion of the famous Rabah. The succeeding number of the *Mouvement* (No. 25) gives some information as to the voyage of Delcommune up the Ruki in 1889. It appears that that officer explored in that year, without being aware at the time, a southern tributary of the Búsira named Salonga, which had not been seen by Grenfell and von François. It has since been further explored by M. Thierry. The courses of the various tributaries of the Congo which unite with the main stream near the equator are shown in a clearly drawn map in the same number, intended to illustrate the theory of M. Wauters that this region, now remarkable for its fertility and luxuriant vegetation, formed the lowest depression of the ancient inland sea, which was drained seawards by the formation of a passage through the coast ranges. The map also shows the channel of Ukaturaka, the longest of the diverging channels which branch off from the main stream between Stanley falls and Bolobo, concerning which some extracts are given from the journal of Delcommune, who surveyed it in company with Captain Martini in 1888.

Districts of the Congo State.—By a decree of July 17, 1895, a modification has been introduced into the administrative subdivision of the Congo state, according to which the number of separate districts now amounts to fifteen, not including that of Lado, leased from Great Britain. The first division into districts took place in 1888, when eleven were formed, and since that date modifications have been from time to time introduced in order to make the boundaries agree better with the actual circumstances of occupation. The boundaries are clearly defined in the *Mouvement Géographique* (1895, No. 23), besides being shown on a map. The largest district is that of Stanley falls, which includes the whole area from the Lomami to Lake Tanganyika. In the more settled parts the areas are much smaller. Many of them are of very irregular shape, being arranged principally on

the basis of accessibility by the various waterways formed by the main river or its tributaries.

New Route to Lake Mweru.—The *British Central Africa Gazette* has lately published (September 15, 1895) the account of a journey made by Mr. P. Weatherley from Lake Tanganyika to Lake Mweru, by a route through the Awemba country, to the south of those usually followed. It seems, in fact, to have led in part through districts not previously traversed by Europeans, although it must have crossed and recrossed Livingstone's route on his last journey to Lake Bangweolo. Leaving Chungu's boma in Ulungu on July 6, 1895, Mr. Weatherley struck west and then southwards, crossing the Luvu (Livingstone's Lofu) and several of its tributaries, and following what he describes as a perfect path through a beautiful and rich country. The scenery on the various hill streams passed roused the traveller's enthusiasm, especially that of the Mkotwe, a tributary of the Luvu, up the narrow valley of which the path led. On the top of the plateau, from which the stream flowed, a splendid path traversed alternately park-like scenery and thick bush, the country being described as the most magnificent seen by the traveller in Central Africa, and stretching away to the south-west in gentle undulations abounding in wood and water. The air was bracing, the thermometer falling to 55° Fahr. at 7 a.m. This part of the route diverged southwards from the direct way to Lake Mweru, in order to allow of a visit to the powerful Awemba chief Mporogoso, with whom Mr. Weatherley succeeded in establishing the most friendly relations, and of whose intelligence, sobriety, and dignified bearing he speaks in glowing terms. Mutilation as a punishment for trivial offences seems however still as prevalent in his dominions as it was in Kazembe's in Livingstone's time, and people who had lost eyes, ears, nose, or fingers were seen on all sides. The Awemba country is divided between three principal chiefs, Mporogoso to the west, Mwamba to the south, and Kitiamkulu to the north-east. The last-named (Ketimkuru of Giraud, who visited his predecessor) was originally the head-chief of the Awemba, but the other two have gradually strengthened themselves at his expense, and owing to the obstructive tactics against the whites which he has pursued, Mr. Weatherley considers it desirable that his rivals should combine to drive him out. Leaving Mporogoso's hospitable boma, which is situated within the basin of the Loangwa, a clear stream tributary to the Kalungwizi, the traveller proceeded north and west, crossing many streams, one of which was bordered by 600 yards of black mud (recalling Livingstone's accounts of the "sponges" of this region). A descent was made from the plateau by two successive steps, from the higher of which a splendid view to the west was obtained, the scenery continuing most beautiful, and becoming gradually more wooded. Game, if present in any quantity, was concealed by the length of the grass, in which it was difficult to find a path. At last, however, Chikwekwe's village, in Itawa, was reached, after which the rest of the way to Mweru was through a country often traversed before.

AMERICA.

The Great Lakes and Niagara.—For some years Dr. J. W. Spencer, of the Great Lakes Geological Survey, has been studying the raised beaches above the present shores of the Laurentian Lakes.* He believes in their marine origin, their formation taking place when the lakes were part of a great arm of the sea. The terraces, however, are inclined to the present water surface of the lakes, and are higher in the north than in the south, in the east than in the west. The uplifts that

* 'Eleventh Report Commissioners N.Y. State Reservation at Niagara.' Albany, 1895.

produced these deformations in the Earth's crust also caused the separation and elevation of the Great Lakes. Lakes Superior, Michigan, and Huron communicated with the sea first by a strait, then by a river passing by Lake Nipissing and the Ottawa valley. The waters of Lake Erie 32,000 years ago were also at the same level as those at the other side of the Niagara isthmus, but the falls began 1000 years later, as the land continued to rise until it was 80 feet higher than now; and 8000 years ago the outflow of the upper lakes was deflected to the present channel by the St. Clair channel, and increased the volume of the Niagara river. The raising of the waters of Ontario 80 feet brought about the present conditions. The basis of this estimate of 31,000 years as the age of Niagara falls is derived from the mean rate of recession in 48 years, as measured from two surveys. Such estimates as that of 9000 years are due to a neglect of the changes in elevation and in volume of the Niagara river that have occurred since its formation. An elevation of 70 feet in the Niagara district would send the waters of the lakes to the Mississippi by Chicago, and in the present mean rate of rise this should happen in 5000 or 6000 years. Dr. Spencer's calculations place the end of the ice age at least 50,000 years ago.

Bolivia-Paraguay Frontier.—In *Petermanns Mitteilungen*, 1895, No. XI., Dr. H. Polakowsky, besides furnishing various statistical data regarding Bolivia, gives particulars as to the frontier between that republic and Paraguay as settled by the treaty of August 28, 1895. The new frontier begins on the Paraguay 15 kilometres north of Fuerte Olimpo (which stands in 21° S.), and runs thence west and somewhat south to the point where the meridian of 61° 28′ W. touches the left bank of the Pilcomayo. The territory south of that line between the Paraguay and Pilcomayo is to belong to Paraguay, that to the north to Bolivia. Paraguay thus receives from Bolivia a considerable portion of the departments of Chuquisaca and Tarija, as drawn in the last edition of Stieler's Hand-atlas, and surrenders to Bolivia a comparatively small angle in the north-west of the Paraguayan Chaco.

AUSTRALASIA AND POLYNESIA.

Explorations in Celebes.—Since the end of 1893, two cousins, Fr. and P. Sarasin, have been making explorations in Celebes with remarkable success. Their first two journeys were in the north-eastern peninsula; the third and most important was across the core of the island from south to north (Gulf of Boni to Gulf of Tomini) in the early part of 1895. The water-parting between north and south is formed by the Takalekajo mountains, which were crossed at the height of 5480 feet. They are covered with dense forest, the passage of which occupied three days. From these mountains the explorers descended to Lake Poso, which they found not to be a crater lake, as had previously been thought, but to occupy a deep tectonic fissure. The surface of the lake is about 1650 feet above sea-level. Near the middle no bottom was found at a depth of 1000 feet, and even near the shore depths of 250 and 350 feet were ascertained. Subsequently the explorers made an attempt to cross the upper end of the south-western peninsula, starting from the bay of Mandar, on the straits of Macassar, but in this attempt they were foiled through the opposition of a native chief. A full account of these latter journeys, with a map (1: 1,000,000), appears in the *Zeitschrift* of the Berlin Geographical Society, 1895, No. 4.

POLAR REGIONS.

An Expedition to the Antarctic.—A commercial syndicate in London has obtained funds sufficient to send an expedition next autumn to Victoria Land for the purpose of whale and seal fishing. It has, we are informed, been arranged that, for a payment of £5000, a party under charge of Mr. E. Borchgrevink will be taken

on board the vessel which is to be equipped by the syndicate. This party will be landed at or near to Cape Adare and be left there for one year, when the ship will return for them. We are informed that specialists in the various departments of investigation are to accompany the expedition, the total number of members comprising it being about twelve. The following is a general plan of the proposed investigations:—1. A land party will work towards the south magnetic pole, there to make magnetical observations. 2. The coast-line of the open bay will be surveyed, fjords and bays explored and sounded. 3. Zoological, botanical, mineralogical, and geological collections will be made. 4. Dredging. 5. Meteorological and pendulum observations. 6. Air and water current observations. Magnetic observations in the south are at present not only urgently required for the purposes of navigation, but also for supplying a missing link in our knowledge of terrestrial magnetism. There will be one vessel, a whaler, of about 300 tons, and a small steamer of 70 tons. The party will leave England on September 1 next.

Mr. Andrée's Balloon Voyage to the North Pole.—At the instance of the Swedish Ministry for Foreign Affairs, notice has been sent to the governments of Russia, Denmark, Great Britain, and the United States, of Herr Andrée's projected balloon voyage to the North Pole, and co-operation asked for on behalf of the expedition. Furthermore, the authorities in the countries surrounding the Polar circle will be asked to distribute some thousands of leaflets, containing illustrations of the balloon, and asking for information as to the time at which the balloon is seen and the direction of the wind at the moment. The Society is co-operating with the Minister of Sweden and Norway in London so far as stations in the Dominion of Canada are concerned.

Crossing of Novaya Zemlya.—In *Petermanns Mitteilungen*, 1895, No. XI. an account is given of a recent expedition to Novaya Zemlya, under Dr. Chernyshev. The expedition left Archangel on July 22 (N.S.), and reached that port again at the end of September. Its principal results were the geological examination of the coast between the west entrance to Matochkin Shar and Nameless Bay (see the maps in *Proc.*, 1880, p. 80), and the crossing of the south island from Karmakuly, on the west coast, to the Kara Sea (August 20 to 27), in the course of which astronomical as well as geological observations were made. Dog-sledges were used for the transport of the baggage.

GENERAL.

The "Challenger" Medal.—To commemorate the completion of the publication of the *Challenger Reports*, Dr. John Murray has presented a medal to the naval and civilian officers of the *Challenger* expedition, the contributors of memoirs to the *Reports*, and to a few other persons who either took part in the promotion of the expedition, or in the work connected with the publication of results. The accompanying illustration, from a photograph by Mr. John Thomson, shows both sides of the medal in the actual size. The work was designed by Mr. W. S. Black, of Edinburgh, an artist who took part in the illustration of the *Challenger Reports*; it was modelled by Mr. Birnie Rhind, of Edinburgh, and cast in bronze at Paris. The design is symbolical of the scope and work of the expedition. The obverse bears the head of Athene and her owl, with the terrestrial globe as a background, which, on the account of the high relief of the figures, looks somewhat flat. Neptune, with a trident in his left hand and a dredge in his right, occupies the right of the field, which is filled by a dolphin and two mermaids, with a scroll inscribed "Voyage of H.M.S. Challenger, 1872–76." The reverse shows the crest of the *Challenger*—a knight in armour throwing down his gauntlet to the sea—and is surrounded by a scroll with the words

"Report on the scientific results of the Challenger Expedition, 1876-95." The memento will be much prized by those who took part in the organization and work of the expedition and reports, and by their representatives to whom the medals

THE "CHALLENGER" MEDAL.

of those who have died before the completion of the work have been given. We are able to give below a complete list of those to whom the souvenir has been presented, the names being given in alphabetical order and exactly as they are engraved on the edge of the medal :—W. J. Abbott, Alexander Agassiz, Pelham

Aldrich, A. J. Allan, G. J. Allman, W. S. Anderson, A. F. Balfour, F. E. Beddard, Rudolph Bergh, G. R. Bethell, W. S. Black, G. S. Brady, A. C. B. Bromley, George Brook, W. K. Brooks, Alexander Buchan, J. Y. Buchanan, George Busk, G. G. Campbell, Alfred Carpenter, P. H. Carpenter, Arthur Channer, James Chumley, Thomas Comber, E. W. Creak, D. J. Cunningham, Arthur Dendy, H. N. Dickson, W. Dittmar, W. T. Thiselton Dyer, A. Milne-Edwards, Otto Finsch, Leopold Marquis de Folin, Michael Foster, T. W. Fulton, John Gibson, G. J. Goschen, L. von Graff, Albert Günther, A. C. Haddon, Ernst Haeckel, S. F. Harmer, Arthur Havergal, W. B. Hemsley, J. R. Henderson, W. A. Herdman, Richard Hertwig, Robert Higham, P. P. C. Hoek, R. E. Horsley, W. A. Howlett, W. E. Hoyle, A. A. W. Hubrecht, T. H. Huxley, John Hynes, Robert Irvine, A. von Kölliker, E. Ray Lankester, R. von Lendenfeld, O. von Linstow, Theodore Lyman, W. C. M'Intosh, George Maclean, J. L. P. Maclear, H. R. Mill, James Monteith, H. N. Moseley, Isabel Murray, G. S. Nares, F. G. Pearcey, Paul Pelseneer, T. Digby Pigott, N. N. Poléjaeff, Laurence Pullar, J. J. Quelch, A. F. Renard, G. H. Richards, R. R. A. Richards, S. O. Ridley, Tommaso Salvadori, Osbert Salvin, G. O. Sars, Howard Saunders, F. E. Schulze, Annie Sclater, P. L. Sclater, A. R. Scott, Emil Selenka, W. P. Sladen, E. A. Smith, W. J. Sollas, W. J. J. Spry, T. R. R. Stebbing, Th. Studer, R. von Willemoes-Suhm, Herbert Swire, P. G. Tait, Hjalmar Théel, C. Wyville Thomson, Frank Tourle Thomson, J. A. Thomson, T. H. Tizard, Alexander Turbyne, William Turner, A. W. Waters, Morrison Watson, R. B. Watson, Amelia Weir, J. J. Wild, E. P. Wright, Richard Wyatt.

Geography in Secondary Schools.—Although the position of geography in primary schools is now fairly satisfactory, it is to be feared that in secondary schools but little progress has been made since the publication of the Society's Report in 1885. Few of the teachers believe that the subject has any educational value, and even when convinced of its capabilities as an instrument of mental training, head masters are deterred by the exigencies of examinations from giving it a prominent place in the school curriculum. To some extent the remedy is in the hands of the public examining bodies, and for that reason the Geographical Association lately drew up four suggestions, which they sent in the form of questions to about three hundred secondary schools. Their report on the ninety-two answers received, which include expressions of opinion from nearly all the great public schools, may be briefly summarized as follows, the substance of the original suggestions being printed in italics: (1) *Papers in Geography should be set and looked over by geographical experts*, who have also had experience in teaching and examining boys. (2) *The Principles of Physical Geography should form part of every examination in Geography.* (3) *The subject of Geography is too wide and vague, and needs to be limited and defined for the purposes of examinations.* A general knowledge of the Earth should be required in all cases, together with a special study of some region, such as a continent, India, or the British Colonies. To indicate the general line of teaching to be followed, and the order in which the special subjects will be taken, a syllabus might be issued from time to time by the boards of examiners jointly; or a text-book might be published by authority for the guidance of teachers and examiners alike. (4) *Geography should either be made compulsory or receive enough marks to make it "pay."* To this it is objected that the pressure of compulsory subjects is already so great that any addition to their number would be intolerable. But the modified form of compulsion implied in the latter alternative is regarded as less objectionable than compulsion pure and simple. Many valuable suggestions have also been received, which the Geographical Association propose carefully to consider before moving any further in the matter. The report (of which the above is a brief summary) may be had on application to the hon. sec., Mr. B. B. Dickinson, Bloxam House, Rugby.

Death of Lieutenant Astrup.—We greatly regret to announce the death of Lieutenant Eivind Astrup, who took an important part in Lieutenant Peary's expedition to North Greenland. He was found lying dead on January 21 in the Lille Elvedal, but what the cause of his death is not known. Besides taking part in the general work of Lieutenant Peary's expedition, Astrup explored Melville Bay on his own account, and gave a narrative of his expedition in the *Geographical Journal*, vol. v. p. 345. For this work the Council awarded him the Murchison grant in 1895.

Death of Herr Hugo Hölzel.—We record with regret the death of Herr Hugo Hölzel, head of the geographical publishing firm of Edw. Hölzel in Vienna, which took place on December 15 last. Hugo Hölzel was born at Olmutz, in Moravia, on February 12, 1852, and in 1878 became head of the business founded by his father fifty years ago. In his hands the reputation of the house for the production of excellent maps and other geographical works was maintained and extended; geographers owe him no small debt of gratitude.

OBITUARY.

Major-General Henry Campbell Johnstone, C.B.

By General J. T. Walker, C.B., F.R.S.

Major-General Johnstone was a well-known officer of the Indian Survey Department. He belonged to the Revenue branch, the duties of which, in his time, consisted in making an exact survey of the boundaries of all British villages on the scale of 4 inches to the mile, and filling in the interior details by plane-tabling, for immediate topographical purposes, and also as a check on the subsequent operations of the Revenue and Settlement officers, whose measurements of areas by rough and primitive methods were required to agree, within a certain percentage, with the more exact measures of the Survey officers.

Such operations lie ordinarily within wholly British territories, and afford no opportunities for geographical exploration. But in 1855 Johnstone was deputed by Lord Laurence into the newly annexed regions west of the Indus, where he had frequently to extend his operations beyond the limits of the newly acquired British villages into the territories of the contiguous wild hill tribes. On this duty he was employed for twenty years. Beginning on the borders of the province of Sind, he worked northwards along the flank of the great Takht-i-Sulimani range to Bannu, and across the Kohat district to the Peshawar valley; he then crossed the Indus, and finished in the beautiful mountain district of Hazara, with its snow-clad peaks rising up to 18,000 and 19,000 feet in height. Here he fixed stations on peaks that had hitherto been pronounced impracticable, and he made an important discovery respecting the true course of the Indus between Astor and the Black mountain.

He always got on well with the wild tribes, and told a good story of an Affridi, who chanced to see his crest, the "flying spur." The man asked what it meant, and was told that in former days men in Scotland were as lawless as the Affridis, and that when the larder was empty, a dish was put before the chief containing only a spur with a pair of feathers attached to it, being a signal to him and his followers to boot and spur, and to raid the cattle over the border, and then the "flying spur" became the badge worn by the clan. The hearts of the frontier Affridis warmed to Johnstone when they found he was a descendant of the British Affridi.

From his professional occupation on the frontier, he was necessarily called on to join the military expeditions which had to be sent to chastise the wild tribe beyond. He thus made important maps of the Bozdai valley in 1857, the Kurram

valley in 1858, the Kabul Khel Waziris in 1859, the Mahsud Waziris in 1860, the Dawur valley in 1861, and the Ambeyla campaign in 1862. He had many adventures and hairbreadth escapes, and was honoured with the Companionship of the Bath and three medals for his military services.

He died on December 30, 1895, aged seventy-two.

CORRESPONDENCE.

The Island of Niuafóu.

HAVING, in September 1886, landed on this volcanic island a few days after the great eruption of that year, I think it may be interesting to compare the appearance of the place at that time with its present condition as described by Lieut. Somerville, R.N., in the last number of this *Journal*.

The eruption burst forth, after a series of earthquakes, from near the north-east side of the lake, which is itself the crater of the original volcano which probably formed the island. Lieut. Somerville's drawing shows the site of the eruption as a peninsula jutting into the lake, with a couple of craters on it. The peninsula, as I saw it in 1886, consisted mainly of a rounded hill some 200 feet high of brown earth, with three seething mouths near its base, towards the land. The contents of one of these was covered with a bright green (? sulphurous) scum; another, of rectangular shape, and deep, was filled with mud and water. These are probably the two mentioned by Lieut. Somerville, and there were one or two others. The shores of the lake beyond were heaped with what might have been pumice, but looked to me more like black sand. The matter ejected from the main vent consisted of volumes of steam enveloping red-hot stones, which rose to an immense height, but fortunately fell straight back again, and which, as they fell, threw off masses of dust which had the effect of fiery tails. This dust, sometimes a brown earth, otherwise a nearly black sand, was carried everywhere by the winds, and two-thirds of the island were buried beneath it, in many places to a depth of several feet. The amount ejected, therefore, was enormous, without reckoning the amount represented by the hill above mentioned of 200 feet, rising out of a very deep lake. The lake was still bubbling, and constant slight tremors and movements of the soil of the island were going on, and gases escaping from it. Vegetation was everywhere crushed by the weight of the sand, which was damp from the steam—the coconuts looking deplorable, with their branches hanging down broken by their sides, the central shoot alone remaining erect. The yam gardens, too, which had just been planted, were overwhelmed, and the people were trying to remove some of the superincumbent weight so as to allow the plants to push through. But even the coco-palms (which bear the biggest fruit of any in the Pacific) probably recovered eventually, though they could not bear for a time, and the dust and sand have long, to judge from Lieut. Somerville's description, disappeared beneath the luxuriant vegetation; though two great lava streams, of nearly fifty and thirty years age respectively, which jut out into the sea like great embankments or breakwaters, are still scantily covered—the latter, indeed, hardly clothed at all.

The dark sand was pronounced by Prof. Bonney to be a basalt glass (tachylyte), with a silica percentage of probably over 50, with specific gravity about 2·73, resembling the glassy lavas of the Sandwich islands.

It is worth noting that the principal earthquakes which preceded the eruption, as early as June 8 and 12, coincided with the first outbreak at Rotomahana, in New Zealand (June 12); while the great eruption, on August 31, was within a few hours of the severe earthquake at Charleston, U.S.A.

It may possibly be inferred, from the name Niuafóu (*i.e.* New Niua, the old being probably Niua-tobutabu, or Keppel island), that the existence of the island is historically recent. It is said, I think, to have been seen by Tasman.

COUTTS TROTTER.

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1895–96.

Fourth Ordinary Meeting, January 6, 1896.—SIR GEORGE GOLDIE, K.C.M.G., Vice-President, in the Chair.

ELECTIONS.—*Rev. John Bufton; Rev. John Meldrum Dryerre, LL.B.; Francis Arthur Farrell; Frederick Craufurd Goodenough; A. C. Hall, B.A.; Evan Hare; Evan Herring Hare, M.A.; I. D. Inverarity; John Alfred Jones; Reginald F. Knollys; Herman Le Roy-Lewis, J.P.; Sir George Glynn Petre, K.C.M.G., C.B.; J. S. Rutherford.*

The Paper read was:—

"A Journey through Somaliland, to Lakes Rudolf and Stefanie, and thence to Lamu by the Tana river." By Dr. Donaldson Smith.

DEATH OF MR. H. SEEBOHM.

The Chairman made the following remarks: Your President, Mr. Clements Markham, has been very ill, and is unable to attend to-night. He has requested me to state that at the time of your last meeting he was already unwell, owing to which he omitted to perform the melancholy duty, which now devolves upon me, of referring to the loss the Society has sustained in the death of one of our Honorary Secretaries, Mr. Henry Seebohm. I ought, however, to say that the funeral of our esteemed and valued colleague was attended both by the President and by our other Honorary Secretary, Major Darwin. I must not dwell at present on the services to geography rendered by Mr. Henry Seebohm, but I may just remind you that there is an excellent obituary notice in the *Journal* of the Geographical Society for January.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

The following abbreviations of nouns and the adjectives derived from them are employed to indicate the source of articles from other publications. Geographical names are in each case written in full:—

A. = Academy, Academie, Akademie.
Ann. = Annals, Annales, Annalen.
B. = Bulletin, Bollettino, Boletim.
Com. = Commerce, Commercial.
C. R. = Comptes Rendus.
Erdk. = Erdkunde.
G. = Geography, Geographie, Geografia.
Ges. = Gesellschaft.
I. = Institute, Institution.
J. = Journal.
M. = Mitteilungen.
Mag. = Magazine.
P. = Proceedings.
R. = Royal.
Rev. = Review, Revue, Revista.
S. = Society, Société, Selskab.
Sitzb. = Sitzungsbericht.
T. = Transactions.
V. = Verein.
Verh. = Verhandlungen.
W. = Wissenschaft, and compounds.
Z. = Zeitschrift.

On account of the ambiguity of the words *octavo*, *quarto*, etc., the size of books in the list below is denoted by the length and breadth of the cover in inches to the nearest half-inch. The size of the *Journal* is 10 × 6½.

EUROPE.

Greece. *Petermanns M.* 41 (1895): 273-279. **Philippson.**
Zur Vegetationskarte des Peloponnes. Von Dr. Alfred Philippson. *With Map.*

Austria—Bosnia-Herzegovina. **Munro.**

Rambles and Studies in Bosnia-Herzegovina and Dalmatia, with an account of the Proceedings of the Congress of Archæologists and Anthropologists held in Sarajevo, August, 1894. By Robert Munro. Edinburgh and London: W. Blackwood and Sons, 1895. Size 9 × 6, pp. xx. and 396. *Illustrations. Price* 12*s.* 6*d. Presented by the Publishers.*

Dr. Munro's book is at once an interesting narrative of a visit to Bosnia-Herzegovina and a connected account of the archæological discoveries made in those provinces, winding up with a summary of what is known of the region during prehistorical and historical times.

The Riviera. **Lenthéric.**

The Riviera, Ancient and Modern. By Charles Lenthéric. Translated by Charles West, M.D. London: T. Fisher Unwin, 1895. Size 8½ × 6, pp. xviii. and 464. *Maps. Price* 7*s.* 6*d. Presented by the Publisher.*

Dr. West has translated M. Lenthéric's well-known work on the Riviera, the value of which he had himself experienced, "not as a Guide-Book, but as a Companion to the intelligent traveller." The translation is fluent, and the book should meet an appreciative public.

ASIA.

Afghanistan. **Gray.**

At the Court of the Amîr. A Narrative. By John Alfred Gray, M.B. London: R. Bentley and Son, 1895. Size 9 × 6, pp. xviii. and 524. *Portraits, etc. Price* 16*s. Presented by the Publishers.*

Dr. Gray here gives a detailed account of his impressions of Afghanistan, with many interesting descriptions of places and personages.

Dutch East Indies. **Van der Chijs.**

Nederlandsch-Indisch Plakaatboek, 1602–1811, door Mr. J. A. Van der Chijs. Dertiende Deel, 1800–1803. Batavia: Landsdrukkerij, 1895. Size 8½ × 5½, pp. 784. *Presented by the Batavian Society of Arts and Sciences.*

India—Chitral. **Younghusband.**

The Relief of Chitral. By Captain G. J. Younghusband and Captain Frank E. Younghusband. London: Macmillan & Co., 1895. Size 9½ × 6, pp. viii. and 184. *Map and Illustrations. Price* 8*s.* 6*d.*

A spirited account of the Chitral expedition by the *Times* special correspondents, provided with excellent illustrations.

India—Kusi River. *J. Asiatic S. Bengal* **64** (Pt. 1) (1895): 1–24. **Shillingford.**

On changes in the course of the Kusi River, and the probable dangers arising from them. By F. A. Shillingford. *With Map.*

Indo-China. *B.S.G. Paris* (7 S.),**16** (1895): 389–404. **Henri d'Orléans.**

Du Tonkin au Yunnan. Par le Prince Henri d'Orléans. *With Sketch-map.*

Malay Archipelago—Celebes. *Z. Ges. Erdk. Berlin* **30** (1895): 311–352. **Sarasin.**

Reiseberichte aus Celebes. Von Paul und Fritz Sarasin. Dritter Bericht. IV. Reise durch Central-Celebes vom Golf von Boni nach dem Golf von Tomini. *With Map.*

This is noticed in the Monthly Record.

Malay Archipelago—Java. **Groneman.**

De Garĕbĕg's te Ngajogyakarta. Door J. Groneman. Met photogrammen van Cephas. Uitgegeven door het Koninklijk Instituut voor de Taal-, Land- en Volken-Kunde van Nederlandsch-Indië. 's-Gravenhage: M. Nijhoff, 1895. Size 10 × 12½, pp. 88.

Malay Archipelago—Sumatra. ———

Phœnician Characters from Sumatra in the Pitt-Rivers Museum. [From Archæologia Oxoniensis. Part. VI., pp. 7.] Oxford; London: H. Frowde, 1895. Size 9½ × 6½. *Plate. Presented by the Publisher.*

This paper will be referred to in the Monthly Record.

Malay Archipelago—Sumatra. **Muller.**

De verplaatsing van eenige Triangulatie-Pilaren in de Residentie Tapanoeli (Sumatra) tengevolge van de aardbeving van 17 Mei 1892. Door J. J. A. Muller. Verhandelingen der Koninklijke Akademie van Wetenschappen te Amsterdam. (Eerste Sectie.) Deel III. No. 2. Amsterdam: J. Müller, 1895. Size 10½ × 7½, pp. 26. *Map and Plates.*

Manchuria and Eastern Siberia. **Launay.**

Missions Catholiques **27** (1895): 186, 200, 208, 228, 261, 269, 281, 297, 307, 317, 331, 343, 353, 368, 377, 389.

Mandchourie et Sibérie Orientale. Par M. Adrien Launay. *With Map and Illustrations.*

Philippine Islands—Typhoons. **Algué.**
Observatorio de Manila. Baquios ó Tifones de 1894. Estudio de los mismos, seguido de algunas consideraciones generales acerca de los caracteres de estos meteoros en el extremo Oriente. Por el P. José Algué S. J. Manila, 1895. Size 12½ × 9, pp. 182. *Diagrams. Presented by the Manila Observatory.*

Russian Armenia—Ani. *Globus* **68** (1895): 263–267. **Krahmer.**
Die altarmenische Hauptstadt Ani. Von Krahmer, Generalmajor z. D. Originalaufnahmen von Orden in St. Petersburg. *With Illustrations.*

Siam. **Grindrod.**
Siam: a geographical summary. By Mrs. Grindrod. London: E. Stanford, 1895. Size 9 × 6, pp. 142. *Map. Price* 5*s. Presented by the Publisher.*

This book has been compiled for the special use of Siamese boys being educated in this country. The plan is a good one, the four main sections being Physiographical, Anthropological, Historical and Political, Commercial and Industrial. Mr. McCarthy's map of Siam, published in the *Journal*, is reproduced with some slight alterations, and the addition of an index to all the names contained in it.

Siberia—Amur Province. *G.Z.* **1** (1895): 580–603. **Immanuel.**
Die Amurprovinz. Beitrag zur Kenntnis der Entwickelungsfähigkeit Ostsibiriens. Von Hauptmann Immanuel in Wittenberg.

Siberia—Transbaikalia. *Petermanns M.* **41** (1895): 217–220. **Krahmer.**
Transbaikalien. Von Generalmajor z. D. Krahmer.

Syria—The Hauran. **Ewing.**
Palestine Exploration Fund, Q. Statement (1895): 60–67, 161–184, 281–294, 355–368.
A Journey in the Hauran. By Rev. W. Ewing. *With Sketch-map.*

Transcaspian Region. *Imp. Asiatic Quarterly Rev.* (2) **10** (1895): 148–155. **Tarnovski.**
Transcaspia and Khurasan. By Capt. Geo. V. Tarnovski.

Transcaucasia—Tiflis Observations. ———
Beobachtungen der Temperatur des Erdbodens im Tiflisser Physikalischen Observatorium in den Jahren 1888 und 1889. Tiflis, 1895. Size 9½ × 7, pp. xx. and 404.

AFRICA.

Algeria and Tunis. **Playfair.**
Handbook for Travellers in Algeria and Tunis. Algiers, Oran, Tlemçen, Bougie, Constantine, Tebessa, Biskra, Tunis, Carthage, Bizerta, etc. By Sir R. Lambert Playfair, K.C.M.G. Fifth edition. London: John Murray, 1895. Size 7 × 5, pp. xiv. and 364. *Maps and Plans. Price* 10*s.* 6*d. Presented by the Publisher.*

The new maps and thorough revision of this handbook, combined with its clear type and thin paper, make the volume fuller, more compact, and easier of reference than ever.

Congo—Bibliography. **Wauters.**
Bibliographie du Congo, 1880–1895. Catalogue méthodique de 3800 ouvrages, brochures, notices et cartes relatifs à l'histoire, à la géographie et à la colonisation du Congo. Par A.-J. Wauters avec la collaboration de M. Ad. Buyl. Brussels: Administration du Mouvement Géographique, 1895. Size 9 × 6, pp. l. and 356. *Presented by the Author.*

This will be noticed along with other books on Africa in a special review.

Congo Free State. *Mouvement G.* **12** (1895): 293–295. ———
Les districts de l'État. *With Map.*

Congo State—Lake Moëro. **Descamps.**
Mouvement Antiesclavagiste Belge **7** (1895): 257–961.
Au lac Moëro. Par le commandant Descamps.

East Africa—Transport. *Deutsche Kolonialzeitung* **8** (1895): 363–365. **Pfeil.**
Der Ochsenwagen in Ostafrika. Von Joachim Graf Pfeil.

Egypt. **Sayce.**
The Egypt of the Hebrews and Herodotus. By the Rev. A. H. Sayce. London: Rivington, Percival & Co., 1895. Size 8 × 5¼, pp. xvi. and 342. *Price* 7*s.* 6*d. Presented by the Publishers.*

Special notice will be taken of this work, the object of which is to supplement the usual sources of information available for tourists and students.

Egypt—Antiquities. **Schweinfurth.**
Ein altes Heiligtum an den Ufern des Möris. Von Georg Schweinfurth. [From *Illustrierte Deutsche Monatshefte.*] 1895. Size 11 × 7½, pp. [12]. *Illustrations. Presented by the Author.*

Egypt—Nile Reservoirs. *Scottish G.M.* **11** (1895): 393–402. **Pearsall.**
The Nile Reservoirs. By H. D. Pearsall.

Egypt—Nile Valley. **Lugard.**
England and France in the Nile Valley. By Captain F. D. Lugard. From the *National Review*, July, 1895, pp. [14]. *Map.* Size 10 × 6¼.

Egyptian Sudan. *B.S. Khédiviale G.* **4** *S.* (1895): 331–351. **Slatin.**
Conférence faite à la Société Khédiviale de Géographie. Par S. E. Slatin Pacha. *With Portrait.*

Equatorial and South Africa. **Peters.**
Aequatorial- und Süd-Afrika nach einer Darstellung von 1719. Der Kongo und der 'Grosse Wald' 160 Jahre vor ihrer Entdeckung durch Stanley. Ophir und die Portugiesischen Goldminen am Sambesi. Von Dr. Carl Peters. Berlin: D. Reimer, 1895. Size 11 × 7½, pp. 16. *Map.*

Eritrea—Climate. *B.S.G. Italiana* (3) **8** (1895): 240–248. **De Magistris.**
Sul clima della Colonia Eritrea. Di L. F. De Magistris.

Eritrea and Somali Land. *Rev. Maritime et Colon* **127** (1895): 225–256. **Brion.**
Les Colonies italiennes, par M. E. Brion.
A general account of the Italian sphere of influence in East Africa.

French West Africa. **Clozel.**
Tour du Monde (*A travers le Monde*): **1** (N.S., 1895): 333–336.
M. Clozel au Congo. Une Nouvelle Voie de Pénétration vers le Tchad. *With Illustrations.*

French West Africa. *Missions Catholiques* **27** (1895): 357–358, 364–367. **Hacquart.**
De Marseille à Ségou-Sikoro (Journal de route de la mission du Soudan). Par le R. P. Hacquart. *With Illustrations.*

French West Africa. *B.S.G. Paris* (7 S.) **16** (1895): 330–373. **Mizon.**
Résultats scientifiques des voyages de M. Mizon, lieutenant de vaisseau (1890–1893).
Itinéraire de la source de la Bénoué au confluent des rivières Kadeï et Mambéré et Essai d'une carte des régions voisines de l'itinéraire. Par L. Mizon. *With Maps.*

French West Africa—Timbuktu. *B.S.G. Paris* (7 S.) **16** (1895): 374–388. **Bluzet.**
La région de Tombouctou. Par R. Bluzet. *With Map.*

French West Africa—Sudan. **Oliver.**
Imp. and Asiatic Quarterly Rev. (2) **10** (1895): 347–375.
French Progress in the Western Soudan, 1894–95. By Captain S. Pasfield Oliver. *With Maps.*

German East Africa. *M. Deutschen Schutzgebieten* **8** (1895): 209–226. **Stuhlmann.**
Ueber die Ulugururberge in Deutsch-Ostafrika. Von Dr. Stuhlmann.

Lagos. *Kew B.* (1895): 241–247. ———
New Rubber Industry in Lagos. *With Plate.*

Madagascar. *Rev. Française* **20** (1895): 625–649. **Nogues and Vasco.**
La puissance maritime de l'Angleterre et l'importance de Madagascar. Par M. Nogues. *With Map.*
Madagascar: les forêts, le caoutchouc—Chronique de l'expédition. Par Gabriel Vasco. *With Map and Profiles.*

Madagascar—Languages. *J. Anthrop. I.* **25** (1895): 46–71. **Last.**
Notes on the Languages spoken in Madagascar. By J. T. Last.

Marocco—Tafilet. **Harris.**
Tafilet. The Narrative of a Journey of Exploration in the Atlas Mountains and the Oases of the North-West Sahara. By Walter B. Harris. Illustrated by Maurice Romberg from sketches and photographs by the author. Edinburgh and London: W. Blackwood and Sons, 1895. Size 8½ × 6, pp. xii. and 386. *Maps and Illustrations. Price* 12*s. Presented by the Publishers.*
This will be referred to in a general review of recent books on Africa.

Portuguese West Africa. *B.S.G. Lisboa* **14** (1895): 5–67. **Paiva.**
Expedição ao Bihé. Estudos do plan' alto. Relatorio official do Major Arthur de Paiva.

Portuguese West Africa—Angola. *Rev. G.* **37** (1895): 241–251. **Rouire.**
La colonie portugaise d'Angola. Les derniers traités qui lui ont donné sa configuration territoriale actuelle. Par Dr. Rouire.

St. Helena—Industries. ——
Notes on the Fisheries and other Industries capable of being profitably undertaken in the Island of St. Helena. Compiled for the St. Helena Industries, Limited. [London: W. J. Richardson (1895).] Size 9½ × 6, pp. 8. *Presented by R. A. Sterndale, Esq.*
The St. Helena Industries is a company which has been formed with the object of restoring to St. Helena some part of the prosperity it formerly enjoyed. The resources and potentialities of the island are clearly summarized in this pamphlet.

Southern Africa. *B.S. d'Études coloniales* **2** (1895): 217–256. **Ivens.**
L'Afrique australe et la colonization néerlandaise. Par M. le Dr. Ivens.
A history of the part played by the Dutch in South Africa.

South Africa. **Worsfold.**
South Africa. A study in Colonial Administration and Development. By W. Basil Worsfold. London: Methuen & Co., 1895. Size 8 × 5¼, pp. xii. and 266. *Map. Price* 6*s. Presented by the Publisher.*
A popular work on the actual conditions of South Africa looked at in the light of the history of European influence northward from the Cape. It contains, as an appendix, the full text of the Convention of London of 1884. The work is a very convenient summary both of the history and of the current thought of the white races in South Africa.

Transvaal—Johannesburg. **Aburrow.**
Bi-Annual Report, ending December 31, 1894, of work done and general information, etc., relating to the Public Works Department of the Johannesburg Sanitary Committee, S.A.R. By Charles Aburrow. 1895. Size 8½ × 5½, pp. 48.

Tunis. **Riban.**
3ᵉ Congrès International d'Agriculture. 9ᵉ Section. La Tunisie. Histoire de la Colonisation. Par Ch. Riban. Tunis, 1895. Size 9½ × 6½, pp. 56. *Presented by the Author.*

Tunis—Bizerta. *Ann. G.* **4** (1895): 464–479. **Maumené.**
Bizerte et son nouveau port. La région de Bizerte. La presqu'île de Porto-Farina. Les Mogods. Le territoire de Mateur. Par M. le capitaine Ch. Maumené. *With Map and Illustrations.*
A description of the new port of Bizerta, by the same author, is also given in *B.S.G. Com., Havre* (1895): 152–172.

Tunis—French Colonization. **Saurin.**
La colonisation française en Tunisie. Par M. Jules Saurin. Congrès National des Sociétés Françaises de Géographie. XVᵉ Session—Lyon, 1894. Compte rendu des travaux du Congrès. Lyon: E. Vitte, 1895. Size 10 × 6½, pp. 290–304.

West Africa—Ashanti. *Scottish G. Mag.* **12** (1896): 10–21. **Dalgleish.**
Ashanti and the Gold Coast. By W. Scott Dalgleish. *With Map.*
The map shows the forests and open pasture land.

Western Sudan—Hausaland. *Scottish G. Mag.* **12** (1896): 21–24. **Robinson.**
Hausaland. By the Rev. Ch. H. Robinson. *With Map.*

NORTH AMERICA.

America. *G.Z.* **1** (1895): 604–613. **Deckert.**
Ueber den Stand der geographischen Forschung in Nord-Amerika (einschliesslich Mittelamerikas und West-Indiens). Von Dr. Emil Deckert.

America. **Deckert, Kükenthal, and Sievers.**
Amerika. Eine allgemeine Landeskunde. In Gemeinschaft mit Dr. E. Deckert und Prof. Dr. W. Kükenthal herausgegeben von Prof. Dr. Wilhelm Sievers. Leipzig und Wien: Bibliographisches Institut, 1894. Size 10½ × 7½, pp. xii. and 688. *Maps and Illustrations* (*some coloured*). *Price* 13*s.* 6*d.*

Canada—Vancouver Island. *Scottish G. Mag.* **11** (1895): 625–635. **Begg.**
Notes on Vancouver Island. By Alexander Begg.

North America—Lake Huron.

No. 108—Part III., Supplement. [U.S.] Hydrographic Office. Sailing Directions for North Channel of Lake Huron and Georgian Bay. Washington, 1895. Size 9½ × 6, pp. 314. *Presented by the U.S. Hydrographic Office.*

United States—Colorado Plateau. *G.Z.* 1 (1895): 481–497. **Credner.**

Ueber das Colorado-Plateau zum Grand Cañon. Ein Vortrag von Prof. Dr. Hermann Credner in Leipzig.

United States—Delaware River. **Walter.**

P.A. Nat. Sci. Philadelphia (1895): 198–205.

Does the Delaware Water Gap consist of Two River Gorges? By Emma Walter. *With Map.*

United States—Indian Territory. *B. American G.S.* 27 (1895): 272–276. **Gannett.**

Indian Territory. By Henry Gannett.

Describes the present state of Indian territory, and anticipates approaching political changes on account of the rapid increase of white population.

United States—Massachusetts—Green Mountains. **Rumpelly, Wolff, Dale.**

Department of the Interior, United States Geological Survey, J. W. Powell, Director. Monographs of the United States Geological Survey, Vol. XXIII. Geology of the Green Mountains in Massachusetts. By Raphael Rumpelly, J. E. Wolff, and T. Nelson Dale. Washington: Government Printing Office, 1894. Size 12 × 9½, pp. xiv. and 206. *Maps and Plates. Presented by the Survey.*

United States—Pacific Coast. **Diller.**

Tertiary Revolution in the Topography of the Pacific Coast. By J. S. Diller.—Fourteenth Annual Report of the United States Geological Survey, . . . 1892–93. By J. W. Powell, Director. Part II. Washington: Government Printing Office, 1894. Size 12 × 8, pp. 397–434. *Maps and Plates. Presented by the U.S. Geological Survey.*

The result of this study is to show the series of changes undergone by the land-surfaces of Northern California since the formation of the auriferous gravels and before the upheaval of the present mountains.

United States—Pennsylvania. *J. Franklin I.* 140 (1895): 105–117. **Rothrock.**

Our Pennsylvanian Forests. By Dr. J. F. Rothrock.

United States—Siouan Tribes. **Mooney.**

Smithsonian Institution, Bureau of Ethnology, J. W. Powell, Director. The Siouan Tribes of the East. By James Mooney. Washington: Government Printing Office, 1894. Size 10 × 6½, pp. 100. *Map. Presented by the Smithsonian Institution.*

United States—Statistics. **Phillips.**

U.S. Department of Agriculture, Weather Bureau. Climate and Health. Edited, under the direction of Professor Willis L. Moore, Chief of Weather Bureau, by W. F. R. Phillips, M.D. Number one. A summary of Statistics for the four weeks ended July 27, 1895. Washington: Weather Bureau, 1895. Size 12½ × 10, pp. 26. *Maps and Diagrams.*

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Showing how geographical principles might have been applied to the determination of boundary-lines in the Guiana Plateau.

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A vindication of Mr. Bevan's claim to the discovery of the Purari river, which he forwards to the Society in order that it may be pasted as an appendix in his book entitled 'Toil, Travel, and Discovery in British New Guinea.'

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Nouvel instrument (Tachéographe) servant au trace direct et au levé direct du terrain. Note de M. Schrader.

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Grundzüge der physischen Erdkunde. Von Prof. Dr. Alexander Supan. Zweite . . . Auflage. Leipzig: Veit & Co., 1896 [1895]. Size 9½ × 6, pp. x. and 706. *Maps and Illustrations. Presented by the Author.*
As a proof of the thoroughness with which this most valuable manual of physical geography has been revised for its second edition, we note the appearance on the bathy-hypsographical maps of the Earth of the deepest sounding found by H.M.S. *Penguin* last June.

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Select Extra-Tropical Plants, readily eligible for Industrial Culture or Naturalization, with indications of their native countries and some of their uses. By Baron Ferd. von Mueller, Government-Botanist for Victoria. Ninth Edition. Melbourne, 1895. Size 8½ × 6, pp. xii. and 654. *Presented by the Author.*
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An account of the position of Spelæology, the science of caverns, in geography.

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Die Wiedergeburt Aegyptens im Lichte eines aufgeklärten Islam. Von Professor Dr. Georg Schweinfurth. Sonderabdruck aus Nr. 24 der "Berliner Rundschau" vom 10. Juli, 1895. Berlin: Thormann & Goetsch. Size 10 × 7, pp. 16. *Presented by the Author.*

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Das unbekannte Südland. Von Professor Dr. S. Ruge.

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Un nouveau globe verrazanien. Par Henry Harrisse.

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Malaio-Polynesische Forschungen. Von Dr. Renward Brandstetter. IV. Die Geschichte von König Indjilai. Eine bugische Erzählung ins Deutsche übersetzt. Zugleich ein Hilfsmittel für das Studium der bugischen Sprache. Luzern, 1895. Size 10½ × 8½, pp. vi. and 28.

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Ueber die Schreibweise von Ortsnamen in den deutschen Kolonien und das vorgeschriebene Alphabet. Von P. Staudinger.

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Irrégularités orthographiques des noms de lieux. Par M. J. V. Barbier.—Congrès National des Sociétés Françaises de Géographie. XV^e^ Session. Lyon, 1894. Compte rendu des travaux du Congrès. Lyon: E. Vitte, 1895. Size 10 × 6½, pp. 284–289.

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d'Albaigne. **Hamy.**
Francisque et André d'Albaigne cosmographes lucquois au service de la France. Par M. le Dr. E.-T. Hamy. (Extrait du Bulletin de géographie historique et descriptive. 1894.) Paris: Imprimerie Nationale, 1895. Size 10 × 6½, pp. 34. *Presented by the Author.*

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James Dwight Dana and his work as a Geologist. By Henry Shaler Williams.

A biographical sketch, with portrait, is also given in the *Deutsche Rundschau G.* 17 (1895): 471–473.

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C. G. Ehrenberg und die wissenschaftliche Erdkunde. Von Professor Dr. Siegmund Günther.

Recalls the services to scientific geography of Ehrenberg's microscopical work, especially by his researches on aërial currents through the nature of blown dust.

Götzen. *Deutsche Rundschau G.* **17** (1895): 470–471. ——
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Gustav Hirschfeld. Gedächtnissrede, gehalten in der Königsberger Geographischen Gesellschaft am 24 Mai, 1895. Von Hans Prutz. Königsberg in Pr.: R. Leupold, 1895. Size 9 × 6½, pp. 22.

Huyghens. **Adam.**
Lettres de Constantin Huygens à Descartes. Publiées par Charles et Henri Adam. (Extrait de la *Revue Bourguignonne de l'Enseignement supérieur*, année 1895.) Size 9 × 6, pp. 48. *Presented by the Author.*

Constantine Huygens, whose letters to Descartes are here printed, was the father of Christian Huygens, the celebrated mathematician.

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Dr. Johannes Kayser.

The late Dr. Kayser of Breslau was the author of several important works on Oceanography.

Lahontan. *P. and T.R.S. Canada* **12**, 1894 (1895): 63–192. **Roy.**
Le baron de Lahontan. Par J. Edmond Roy.

A complete biography of Louis Armand de Lom d'Arce, from whose account of his stay in North America from 1683 to 1693 correct ideas of Canada first became popularly known in Europe.

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In Memoria di Carlo Piaggia; conferenza letta il 23 settembre 1894 . . . del Dott. Avv. Federigo Bonola Bey. Lucca: Tip. Baroni, 1895. Size 9 × 6, pp. 32. *Presented by the Author.*

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In Memoriam. Charles Ploix. 21 Février, 1895. [Par Henri Cordier.] (Extrait de la Revue des Traditions populaires.) Baugé: Imp. Daloux, 1895. Size 10 × 6½, pp. 8. *With Portrait. Presented by the Author.*

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Commemorazione del Principe Eugenio Ruspoli. Discorso del consigliere prof. Elia Millosevich. *With Map and Portrait.*

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Ballooning. *Mém. S.R.G. d'Anvers* **4** (1895): 235–270. **Wouwermans.**

Contribution à la bibliographie de la locomotion aérienne. Par Armand Wouwermans.

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Le problème bibliographique. Par M. Marcel Baudouin.

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The Torch and Colonial Book Circular. Including classified lists of New Publications—English, American, and Colonial—in all departments of Literature, Science, and Art. Edited by Edward Augustus Petherick. London: E. A. Petherick & Co., 1887–1892. Size 10½ × 7½. *Presented by E. A. Petherick, Esq.*

Mr. Petherick has presented to the Society this handsome volume, containing all that was published of his valuable periodical of colonial bibliography. It fills a gap in the Library.

Bibliography, Greek. **Sakkelionos.**

Εθνικη Βιβλιοθηκη τησς Ελλαλοσς. Καταλογοσς των Χειρογραφων τησς Εθνικησς Βιβλιοθηκησς τησς Ελλαδοσς Υπο Ιωαννου Σακκελιωνοσς. Και Αλκιβιαδου Ι. Σακκελιωνοσς. Athens, 1892. Size 10 × 7, pp. 340. *Plates.*

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A useful subject-index of the principal contents of the more important monthly and quarterly magazines and reviews. To judge by the treatment of articles from the *Geographical Journal*, the work is done with care and discrimination.

British Empire. **Cuningham.**

A Scheme for Imperial Federation, a Senate for the Empire. Three articles reprinted, with additions, from *The Westminster Review* of April, July, and October, 1879. By Granville C. Cuningham. With an Introduction by Sir Frederick Young, K.C.M.G. London: Longmans & Co., 1895. Size 8 × 5½, pp. xii. and 116. *Price 3s. 6d. Presented by the Publishers.*

Church Missionary Society. ——

Proceedings of the Church Missionary Society for Africa and the East. Ninety-sixth year, 1894–95. London: Church Missionary House, 1895. Size 8½ × 6, pp. lxx., 346, and (358). *Maps. Presented by the Church Missionary Society.*

Educational. **Collie.**

Report on Governmental Maps for use in Schools. Prepared by a Committee of the Conference on Geography held in Chicago, Ill., December, 1892. [Davis King Collie.] New York: H. Holt & Co., 1894. Size 8½ × 5½, pp. 66. *Price 2s. 6d.*

Educational—Methods. *G. Z.* **1** (1895): 90–100. **Kirchhoff.**

Sinn und Behandlungsweise der "Politischen Geographie" im Schulunterricht. Von Alfred Kirchhoff.

Educational—Methods. *G.Z.* **1** (1895): 442–459. **Langenbeck.**

Der erdkundliche Unterricht nach den neuen Lehrplänen. Von Dr. R. Langenbeck, in Strassburg i. E.

Educational—Methods. *Rev. G.* **37** (1895): 81–84. **Almeida.**

Gogol géographe. Par P. Camena d'Almeida.

A sketch of the method of geographical instruction proposed by the Russian dramatic poet Gogol, published in Russian in 1831 and 1834.

Educational—Russian Text-Book. **Steinhauer.**

I. S. Steinhauer. First lessons in geography, arranged for use in schools with non-Russian populations. [In Russian.] St. Petersburg: N. P. Karbasnikoff, 1895. Size 9½ × 6½, pp. iv. and 92. *Presented by the Author.*

Educational—Text-Books. **Molard.**

Cours de Géographie rédigé conformément au nouveau programme d'admission à l'École Spéciale Militaire. Par J. Molard, France. Paris: Jouvet & Co., 1892. Size 7½ × 5, pp. xii. and 376. Atlas accompanying. Size 12½ × 10.

Ditto. Colonies Françaises. Asie—Afrique—Amérique—Océanie. Paris: Jouvet & Co., 1892. Size 7½ × 5, pp. iv. and 244. Atlas accompanying. Size 13 × 10.

Figure of the Earth. **Jordan.**

The Cardioid Earth. By William Leighton Jordan. London: Spottiswoode & Co., 1895. Size 8½ × 5½, pp. 18. *Presented by the Author.*

Mr. Jordan refers to the cruise of the *Challenger* in relation to the figure of the Earth.

Fisherman's Nautical Almanack. **Olsen.**

The Fisherman's Nautical Almanack and Tide Tables. A Directory of British and Foreign Steam Trawlers, Smacks, etc. By O. T. Olsen. [20th year,] 1896. London: J. D. Potter [1895]. Size 7½ × 5, pp. 408. *Price* 1*s*. *Presented by the Author.*

Folklore. **Sacken.**

C. R. Osten Sacken. Additional Notes in explanation of the Bugonia-Lore of the Ancients. Heidelberg: J. Hoerning. London: R. H. Porter, 1895. Size 9½ × 6, pp. 24. *Presented by the Author.*

Ice. *J. Franklin I.* **140** (1895): 355–370, 437–455. **Vedel.**

On the Growth and Sustaining Power of Ice. By P. Vedel.

A mathematical treatise to ascertain the bearing power of ice under various strains. It is noted incidentally that "2-inch ice will sustain a man or properly spaced infantry; 4-inch ice will carry a man on horseback, or cavalry, or light guns; . . . 8-inch ice a battery of artillery, . . . but not over 1000 lbs. per square foot on sledges. . . . On 15-inch ice railroad tracks are often laid and operated for months, and 2-feet thick-ice withstood the impact of a loaded passenger car after a 60-feet fall (or perhaps 1500 foot-tons), but broke under that of the locomotive and tender (or perhaps 3000 foot-tons)."

International Statistical Institute. ———

Bulletin de l'Institut International de Statistique. Tome IX. Première Livraison. Rome, 1895. Size 10½ × 7½, pp. viii., 124, 54, and [28].

Lady Travellers. **Barbier.**

Rôle des voyageuses françaises dans la géographie. Par M. J. V. Barbier.—Congrès National des Sociétés Françaises de Géographie. XV^e^ Session. Lyon, 1894. Compte rendu des travaux du Congrès. Lyon: E. Vitte, 1895. Size 10 × 6½, pp. 256–283.

Planetary Geography. *Le Globe B.* **34** (1895): 119–131. **Gautier.**

Mars et la Terre: aréographie et géographie comparées. By M. le Professor Raoul Gautier.

A comparison of the observed conditions of the surface of Mars with those of the Earth.

Sixth International Geographical Congress. **Friederichsen.**

Der Sechste Internationale Geographen-Kongress in London. (26 Juli–3 August, 1895.) Von L. Friederichsen. Separatabdruck aus den Mittheilungen der Geographischen Gesellschaft in Hamburg. Size 9½ × 6½, pp. 28. *Presented by the Author.*

Sport. **Phillipps-Wolley.**

Big Game Shooting. By Clive Phillipps-Woolley. With contributions by Sir Samuel W. Baker, W. C. Oswell, F. J. Jackson, Warburton Pike, and F. C. Selous; Lieut.-Colonel R. Heber Percy, Arnold Pike, Major Algernon C. Heber Percy, W. A. Baillie-Grohman, Sir Henry Pottinger,

Bart., Earl of Kilmorey, Abel Chapman, Walter J. Buck, and St. George Littledale. [The Badminton Library.] 2 vols. Second Edition. London: Longmans & Co., 1895. Size 8 × 5½, pp. (vol. i.) xvi. and 454; (vol. ii.) x. and 444. *Illustrations. Price* 21*s.*

Travel. *Globus* **68** (1895): 320–323. **Tamai.**

Eine japanische Reise um die Welt vor 100 Jahren. Uebersetzt von Kisak Tamai, aus Japan, z. Z. in Berlin.

NEW MAPS.

By J. Coles, *Map Curator*, R.G.S.

EUROPE.

Caucasus. **Radde.**

(1) Karte des nordöstlichen Kaukasus, zur übersicht der Marschrouten Dr. Gustav Radde's u. Dr. E. König's im Jahre 1894. Scale 1:1,500,000 or 23·6 stat. miles to an inch. Petermann's 'Geographische Mitteilungen.' Ergänzungsheft No. 117, Tafel 1. Gotha: Justus Perthes, 1895. *Presented by the Publisher.*

(2) Der Tebulos u. Basch-Lam Stock. Scale 1:220,000 or 3·4 stat. miles to an inch. Petermann's 'Geographische Mitteilungen.' Ergänzungsheft No. 117, Tafel 2. Gotha: Justus Perthes, 1895. *Presented by the Publisher.*

England and Wales. **Ordnance Survey.**

Publications since December 7, 1895.

1-inch—General Maps:—

ENGLAND AND WALES:—93, 94, 105, 106, 118, 119, 120, 136, 150, 226, engraved in outline; 79, 88, 267, 300, 308, 316, 318, 323, 336, 346 (revision), engraved in outline, 1*s.* each.

6-inch—County Maps:—

ENGLAND AND WALES:—**Lancashire**, 35, 43, 44, 45, 2*s.* 6*d.* each. **Yorkshire**, 1, 49, 2*s.* 6*d.* each.

25-inch—Parish Maps:—

ENGLAND AND WALES:—**Berkshire** (revised), XLII. 12. **Hampshire** (revised), II. 12; VIII. 4, 15; XXIV. 2, 7, 10. **Middlesex** (revised), XV. 13; XIX. 7, 11; XX. 9, 3*s.* each.

Town Plans—10-feet scale:—

ENGLAND AND WALES:—**Newcastle, Gateshead, and Environs** (revised), CXVII. 2*s.* 6*d.* Index not yet published.

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London—Re-survey, II. 60, 70; III, 21, 31, 32, 41, 42, 51, 64; VII. 2, 22, 13, 33, 38, 42, 43, 52, 53, 63, 72, 83; X. 18; XI. 2, 7, 8, 9, 11, 17, 18, 28, 40, 60, 79; XII. 61; XV. 3, 4, 5, 6, 8, 9, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 25, 26, 29, 30, 33, 39, 40, 44, 46, 49, 50, 55, 58, 59, 60, 64, 74; XVI. 31, 32, 33, 34, 41, 42, 44, 51, 52, 54, 55, 62, 63, 64, 65, 74; XVII. 7, 35, 2*s.* 6*d.* each. Index, 3*d.*

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Germany. **Langhans.**

Fremde Volksstämme in Deutschen Reiche verglichen mit der Verteilung der Christlichen Hauptbekenntnisse, auf Grund der neuesten amtlichen u. ausseramtlichen Aufnahmen gemeindeweise bearbeitet von Paul Langhans. Auf Vogels Karte des Deutschen Reichs in Stieler's Hand-Atlas. Scale 1: 1,500,000 or 23·7 stat. miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1895, Tafel 17. Gotha: Justus Perthes. *Presented by the Publisher.*

Germany. **Lepsius.**

Geologische Karte des Deutschen Reichs, auf Grund der unter Dr. C. Vogels Redaktion in Justus Perthes' Geograph. Anstalt ausgeführten Karte in 27 Blättern in 1: 500,000 (or 7·9 stat. miles to an inch), bearbeitet von Dr. Richard Lepsius. Gotha: Justus Perthes, 1895. Lieferung V. Blatt 19, Dresden; 20, Görlitz. Lieferung VI. Blatt 12, Münster; 21, Breslau. *Price* 3 *marks, each part containing* 2 *sheets.*

Greece. **Philippson.**

Vegetations-Karte des Peloponnes, von Dr. Alfred Philippson. Scale 1 : 625,000 or 9·8 stat. miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1895, Tafel 18. Gotha: Justus Perthes, 1895. *Presented by the Publisher.*

Iceland. **Thoroddsen.**

Geologische Karte des Südostlichen Island, von Th. Thoroddsen. Reduziert nach der Originalkarte in der Zeitschrift d. Königl. Danischen, Geogr. Ges. v. 1895-96. Scale 1 : 1,000,000 or 15·8 stat. miles to an inch. Petermann's 'Geographische Mitteilungen,' Jahrgang 1895, Tafel 19. Gotha: Justus Perthes, 1895. *Presented by the Publisher.*

Switzerland. **Swiss Federal Staff.**

Topographischer Atlas der Schweiz im Massstab der Original-Aufnahmen nach dem Bundesgesetze vom 18, Dezember 1868 durch das eidg. topogr. Büreau gemäss den Direktionen von Oberst Siegfried veröffentlicht. Scales 1 : 25,000 or 2·5 inches to a stat. mile, and 1 : 50,000 or 1·25 inches to a stat. mile. XLV. Lieferung. 382, Isenthal; 420, Ardez; 430, Les Plats; 434, Biere; 436, Aubonne; 436bis, Rolle; 437bis, Bouches de la Dranse; 443, Begnins; 474, Vouvry; 474bis, Pas de Morgins; 514, Locarno; 537, Brissago. *Price* 1 *mark each sheet.*

ASIA.

Asia Minor. **Diest and Anton.**

Itinerar-Aufnahmen im nordwestlichen Kleinasien (Bythynien und Galatien). Ausgeführt im Mai-Juni 1892 und April-Juni 1893, von Major v. Diest und Premierlieutenant Anton. Scale 1 : 250,000 or 3·95 stat. miles to an inch. Petermann's 'Geographische Mitteilungen.' Ergänzungsheft, No. 116, Tafel 1, 2, & 3. Gotha: Justus Perthes, 1895. *Presented by the Publisher.*

Indian Government Surveys. **Surveyor-General's Office, Calcutta.**

Indian Atlas, 4 miles to an inch. Sheets: 61, parts of districts Malabar, Coimbatore, Madura, and Salem (Madras Presidency), and of district Mysore (Mysore Native State) and Coorg; 65, parts of Bisahir (Kanawar), and the Native State of Teeree (Foreign Gurhwal), of Tibet, and of districts Kangra (Punjab), Gurhwal, and Almora (N.W. Provinces); 107 parts of districts Sambalpur, Patna and Kalahandi (Central Provinces), Band, Daspalla, etc. (Orissa Tributary States), and Goomsur, Kimedi, Jeypore, and Ganjam (Madras Presidency); 112, parts of districts Darbhanga, Muzaffarpur, Patna, Gaya, Hazaribagh, etc. (Bengal); 120, parts of districts Nadia, Burdwan, Jessore Faridpur, Dacca, etc. (Bengal). Quarter Sheets; 2 S.E., parts of districts Kurachi, Jhirruk, Sehwan, etc.; 23 S.E., parts of districts Surat and Broach, of Native States Baroda, Rewa, Kantha, and Surat Agencies (Bombay Presidency); 48 N.W., parts of districts Umballa, Ludhiana, and Karnal, and of Patiala, Nabha, etc. (Punjab); 59 N.W., parts of districts Shimoga and Chitaldroog (Mysore State). Preliminary edition: 66 N.E., parts of districts Almora and Garhwal (N.W. Provinces), and Hundes (Tibet); 66 N.W., parts of districts Garhwal, Dehra Dun, and Native State Tehri Garhwal (N.W. Provinces); 70 S.E., parts of districts Damoh and Jubbulpore (Central Provinces), and of Native States Panna, Ajaigarh, and Maihar (Central India Agency); 87 S.E., parts of districts Azamgarh, Gorakhpur, Basti, Fyzabad, etc. (N.W. Provinces and Oudh); 105 N.W., parts of districts Lohardaga and Palamau, and of Sarguja and Jashpur States (Chota Nagpur), Bengal; 125 N.W., parts of districts Kamrup, Sylhet, Khasi, and Jaintia Hills, Garo Hills (Assam), and of Mymensingh (Bengal); 126 S.W., parts of districts Noakhali, Tippera, Dacca, Backergunge (Bengal), and Hill Tippera (Native State).—India, 64 miles to an inch, 4 sheets, additions to railways to 1895.—India, 64 miles to an inch, outline, 1895, 2 sheets.—Punjab Survey, 1 inch to a mile, Season 1867-84: No. 243, district Hissar and Bickaneer State; No. 260, district Hissar and Bickaneer State.—India, showing railways, corrected up to March 31, 1895, 80 miles to an inch.—North-West Provinces and Oudh Survey, 1 inch to a mile, Seasons 1866-91: No. 49 (2nd edit.), district Moradabad and Rampur State; No. 64 (2nd edit.), districts Naini

Tal and Moradabad, and Rampur State; No. 65 (2nd edit.), districts Moradabad, Paini Tal, and Bareilly, and Rampur State; No. 67 (2nd edit.), districts Bareilly and Budaun, and Rampur State; No. 68, districts Budaun and Bareilly; No. 81, districts Naini Tal, Pilibhit, and Bareilly; No. 83, districts Bareilly and Pilibhit; No. 178 (2nd edit.), district Fyzabad.—Bombay Survey, 1 inch to a mile, Seasons 1872-94: Sheets, No. 175, part of district Ratnagiri; No. 199, districts Poona, Satara, and Kolaba, and Bhor State; No. 224, district Nasik and Baroda State; No. 228, districts Nasik and Ahmednagar; No. 242, parts of Belgaum district and Kolhapur, Inchalkaranji, Sangli, and Savantvadi States; No. 270, Districts Sholapur and Satara, and Kolhapur and Southern Maratha Agencies; No. 308, parts of Dharwar and N. Kanara districts, and Jainkhandi, Miraj Senior, Miraj Junior, and Sangli States.—Bengal Survey, 1 inch to a mile, Seasons 1854-56 and 1857-60; No. 378, districts Mymensingh and Dacca.—Madras Survey, 1 inch to a mile, Seasons 1887-90, Sheet No. 152, parts of districts Madura and Tinnevelly (Madras), Seasons 1887-90, No. 152.—Hyderabad Survey, 1 inch to a mile, No. 150, Golkondah, Circar, Seasons 1821, 1822, and 1827.—Central India and Rajputana Survey, 1 inch to a mile, Seasons 1854-84: No. 421, parts of districts Saugor and Damoh (Central Provinces), and of Panna Native States (Central India Agency), No. 429, parts of Panna, Bijawar Chhatarpur, and Ajaiarh States, Bundelkhand (Central India Agency), and of district Damoh (Central Provinces); No. 482, parts of Rewah State (Central India Agency), and of district Mirzapur (N.W. Provinces).—Upper Burma Survey, 1 inch to a mile, Season 1893-94, Sheet 313, Southern Shan States.—Lower Burma Survey, 1 inch to a mile, Seasons 1890-94, Nos. 374, 375, 376, district Amherst.—South-Eastern Frontier, 1 inch to 4 miles: No. 1 N.E. (6th edit.), parts of districts Upper Chindwin, Katha, and Shwebo (Upper Burma), and of Manipur Native State (Assam), Seasons 1886-94; No. 1 N.W. (4th edit.), parts of Chittagong Hill Tracts, South Lushai Hills, and Hill Tippera (Bengal), of Chin Hills (Upper Burma), and of North Lushai Hills and Native State of Manipur (Assam), Seasons 1853-66, 1871-72, 1888-90, 1891-92, and 1893-94; No. 2 S.E. (4th edit.), part of districts Pakokku, Minbu, Myingyan, Meiktila, Yamethin, and Magwe (Upper Burma), Seasons 1889-91; No. 5 S.E. (4th edit.), part of Southern Shan States and of Siam, Seasons 1887-94.—North-Eastern Frontier, 1 inch to 8 miles, No. 15 (3rd edit.), parts of districts Sylhet, Cachar, Nowgong, Khasi, and Jaintia Hills, Naga Hills, and Native State Manipur (Assam), of Upper Chindwin, Katha, and Lushai Hills (Burma), and of Hill Tippera (Bengal).—North-Eastern Frontier, 1 inch to 4 miles: Sheets, No. 15 N.E. (3rd edit.), parts of Naga Hills, Naga Tribes, and Manipur (Assam), and of district Upper Chindwin (Upper Burma), Seasons 1885-86 and 1893-94; No. 15 S.E. (6th edit.), parts of Manipur (Assam), and of districts Upper Chindwin and Katha (Upper Burma), Seasons 1881-82 and 1886-94; No. 15 S.W., parts of districts Sylhet, Cachar, and North Lushai Hills, and Native States of Manipur (Assam), and Hill Tippera (Bengal), Seasons 1860-74 and 1893-94.—Route Maps for the Western Himalayas, Kashmir, Punjab, and Northern India, with portions of Afghanistan, Baluchistan, etc. (including the former Kashmir Route Map), 1 inch to 32 miles; additions to 1894.—The Province of Assam, 1 inch to 16 miles; additions and corrections to May, 1895.—District Burdwan, 4 miles to an inch; additions to January, 1895.—District Malda, Lower Provinces, Bengal, 4 miles to an inch, 1895. District Darbhanga, Lower Provinces, Bengal, 1 inch to 4 miles, 1895.—District Sylhet, Assam, 4 miles to an inch, 1894.—District Almora, 1865-69 and 1871-77, 1 inch to 2 miles, 6 sheets; published June, 1895.—District Cuttack, Bengal, 1 inch to 8 miles, 1890.—District Howrah, Bengal, 1 inch to 8 miles, 1890.—District Midnapore, Bengal, 1 inch to 13·5 miles, 1889.—District Monghyr, Bengal, 1 inch to 8 miles, 1890.—District 24, Parganas, Bengal, 1 inch to 8 miles, 1890.—District Gujrat, Punjab, 1 inch to 8 miles, 1895.—District Jaunpur, N.W. Provinces and Oudh, 1 inch to 8 miles, 1895. District Sultanpur, N.W. Provinces and Oudh, 1 inch to 8 miles, 1895.—District Jubbulpore, Central Provinces, 1 inch to 8 miles, 1895.—Index Map of the Kumaun and Garhwal Forest Survey, 1 inch to 8 miles; corrections to August, 1893. Photo-lithographed May, 1895.

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AFRICA.

Algeria. **Service géographique de l'Armée, Paris.**

Carte topographique de l'Algérie. Scale 1 : 50,000 or 1·25 inches to a stat. mile. Service géographique de l'Armée, Paris. Sheet: No. 50, Sidi Merouane; No. 107, Beni bon Douane; No. 243, Taria. *Price* 1 *fr.* 50 *c. each sheet.*

French Congo. **Hansen.**

Congo Français. Carte dressée à l'échelle de 1 : 1,500,000 (or 23·7 stat. miles to an inch). Paris, 1895. Service géographique des Colonies. 2 sheets, with index. *Presented by M. le Ministre des Colonies, Paris.*

This is an important map, in the compilation of which the most recent and reliable material has been used. All the principal routes of travellers are shown in red, together with the date of the exploration. Insets are given of the country between Lake Chad and the Nile, and the Lower Congo district.

AMERICA.

Colombia. **Simons.**

Carta Corográfica del Departamento de Bolivar. Levantada de órden del Gobierno General. Por Federico A. A. Simons, Ingeniero. Bogotá, 1895. Scale 1 : 785,000 or 12·3 stat. miles to an inch. W. & A. K. Johnston, lithographers, Edinburgh & London.

Carta Corográfica del Departamento del Magdalena. Levantada de órden del Gobierno General. Por Federico A. A. Simons, Ingeniero. Bogotá, 1895. Scale 1 : 810,000 or 12·7 stat. miles to an inch. W. & A. K. Johnston, lithographers, Edinburgh & London. *Presented by the Author.*

These maps of the Departments of Bolivia and Magdalena have been specially prepared for the Colombian Government by Mr. A. A. Simons, who has been employed for a considerable time in making compass surveys in order to correct existing maps. All means of communication are shown, and they contain a large amount of additional information.

CHARTS.

Pacific Ocean. **U.S. Hydrographic Office.**

Pilot Chart of the North Pacific Ocean, December, 1895. Published monthly at the Hydrographic Office, Bureau of Navigation, Department of the Navy, Washington, D.C. Charles D. Sigsbee, Commander U.S. Navy Hydrographer. *Presented by the U.S. Hydrographic Office.*

GENERAL.

Historical Geography. **Schrader.**

Atlas de Géographie Historique. Ouvrage contenant 54 grandes Cartes doubles en couleurs, accompagnées d'un Texte historique au dos, et d'un grand nombre de Cartes de Détail, Figures, Diagrammes, etc. Par une Réunion de Professeurs et de Savants sous la direction Géographique de F. Schrader, directeur des travaux cartographiques de la librairie Hachette et Cie. Parts 15, 16, 17. Paris: Librairie Hachette et Cie, 1895. *Price* 1 *fr.* 50 *c. each part.*

The following maps are contained in these parts:—Part 15, Empire D'Alexandre, with insets; France Féodale; L'Amérique au XIXe Siècle. Part 16, La Conquête de la France par la Royauté Capétienne; Allemagne et Italie en 1815 et en 1866; Monde Musulman. Part 17, Croisades; Le Domaine de la Guerre de Cent Ans; Europe de Charles-Quint et de Soliman. In addition to the principal maps there are numerous plans and insets, and explanatory letterpress is given on the back of each sheet.

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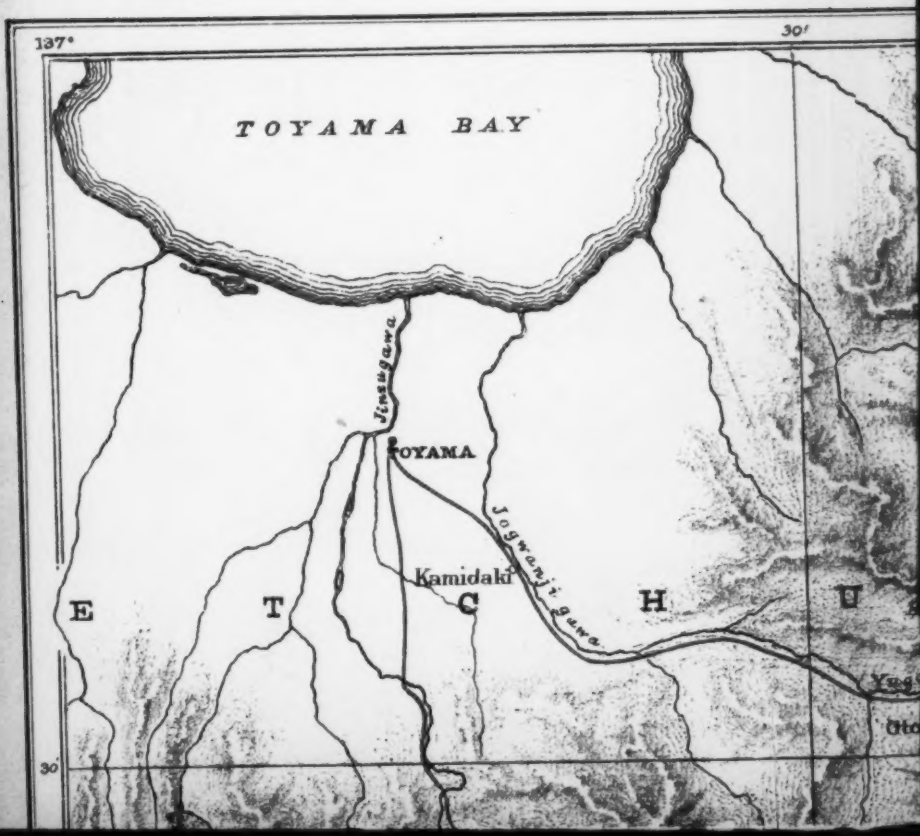
N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.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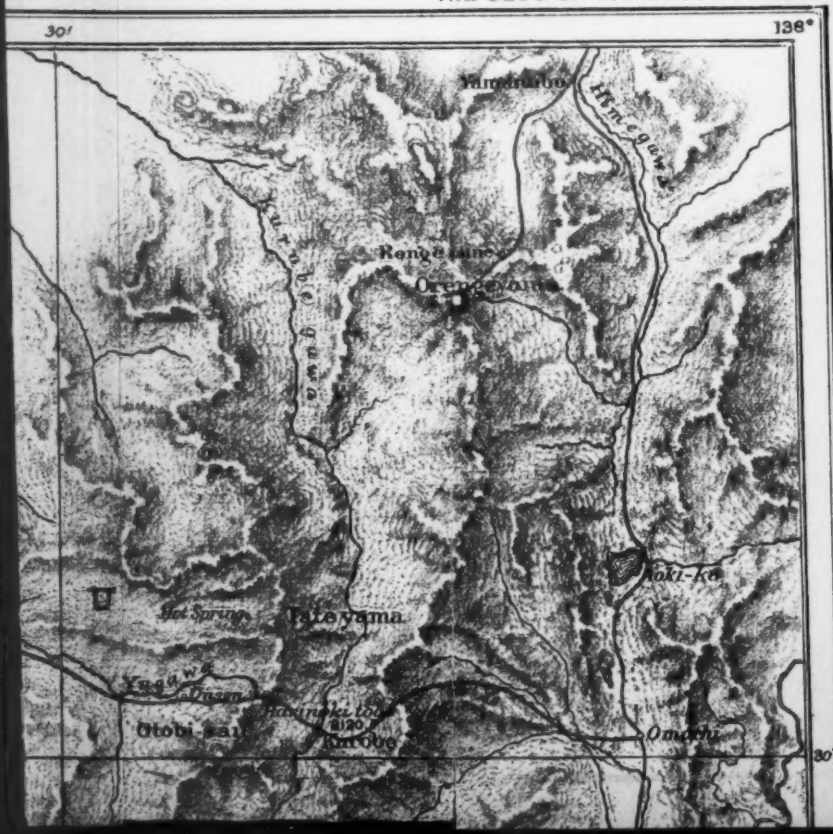
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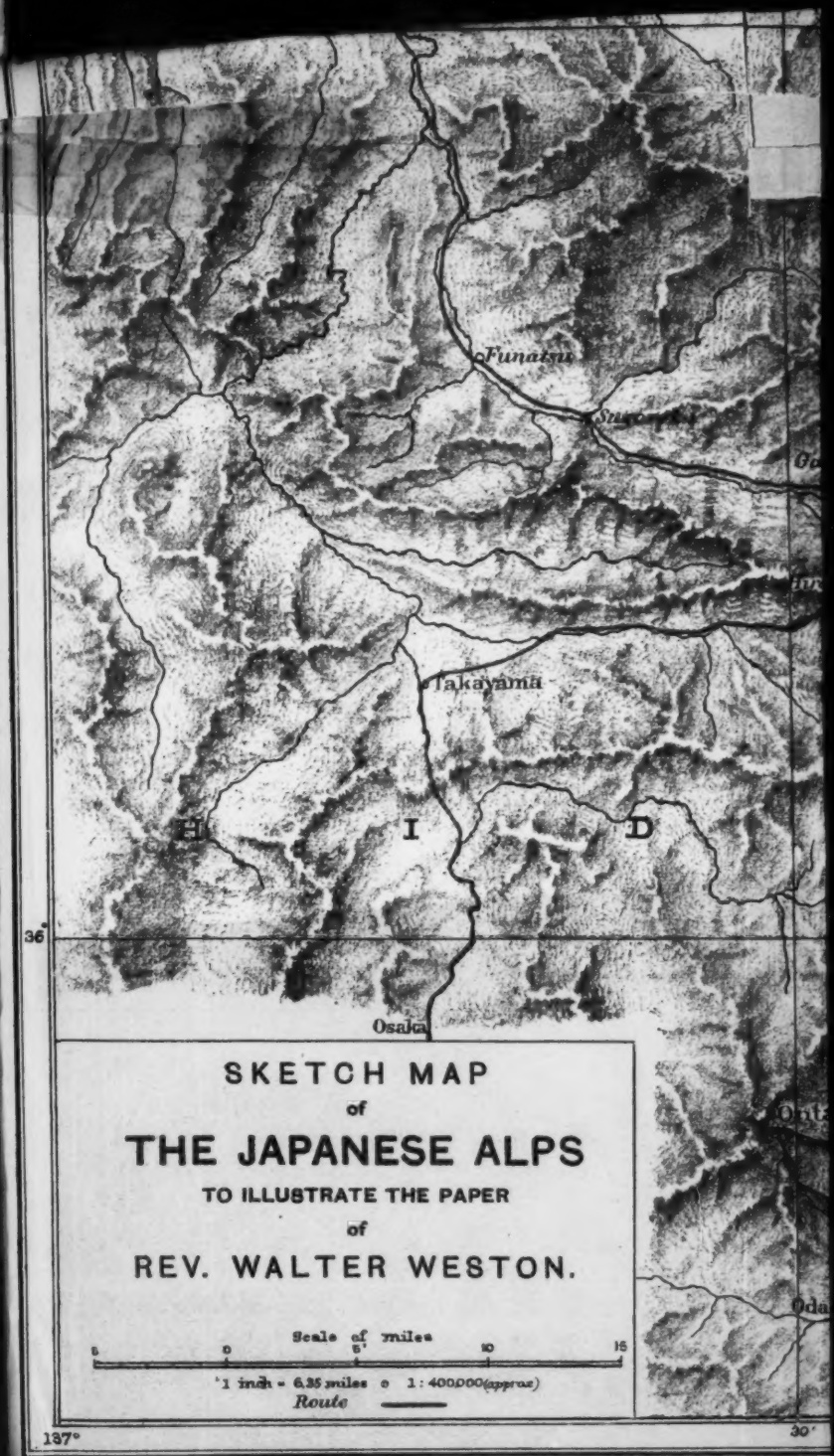

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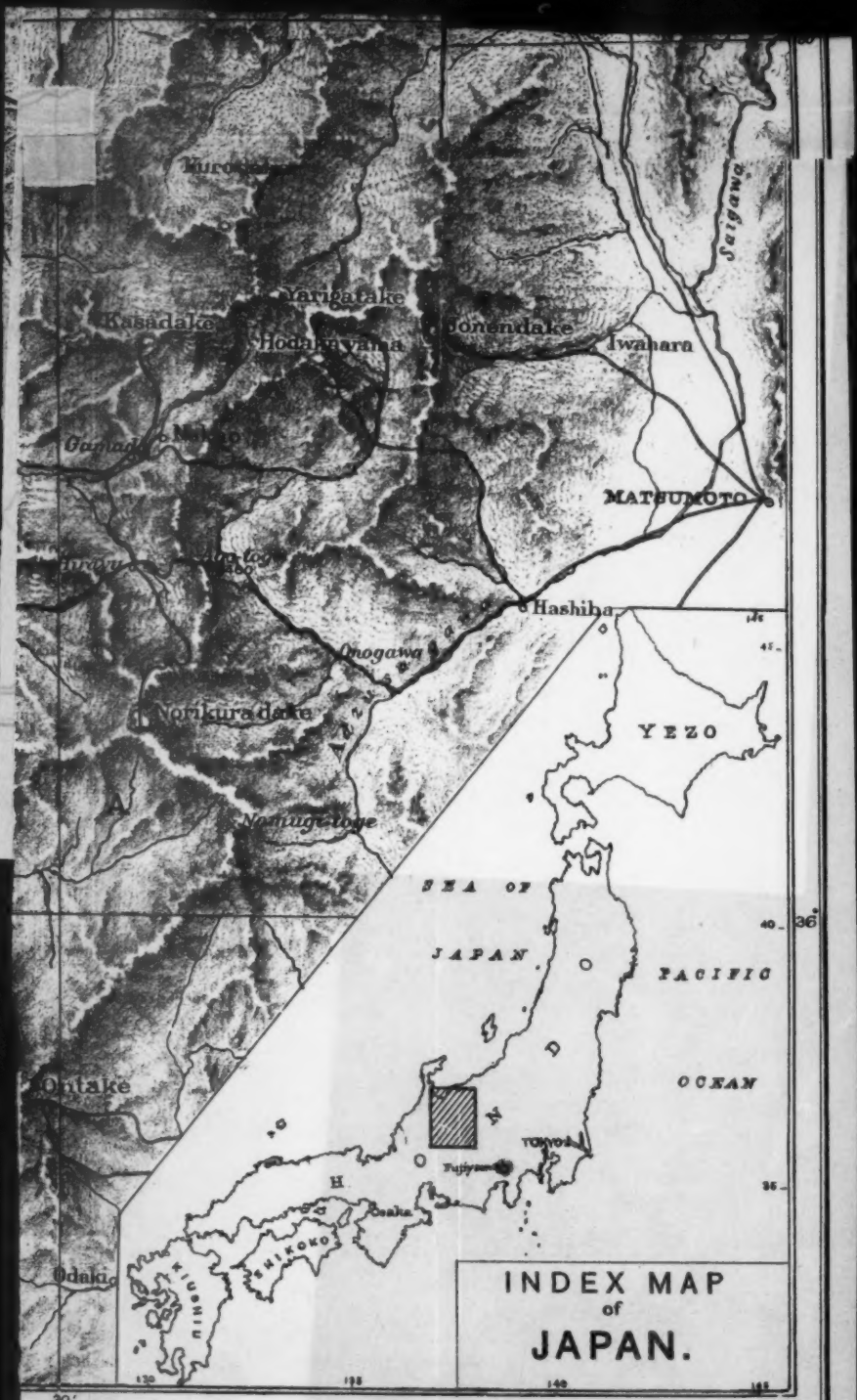

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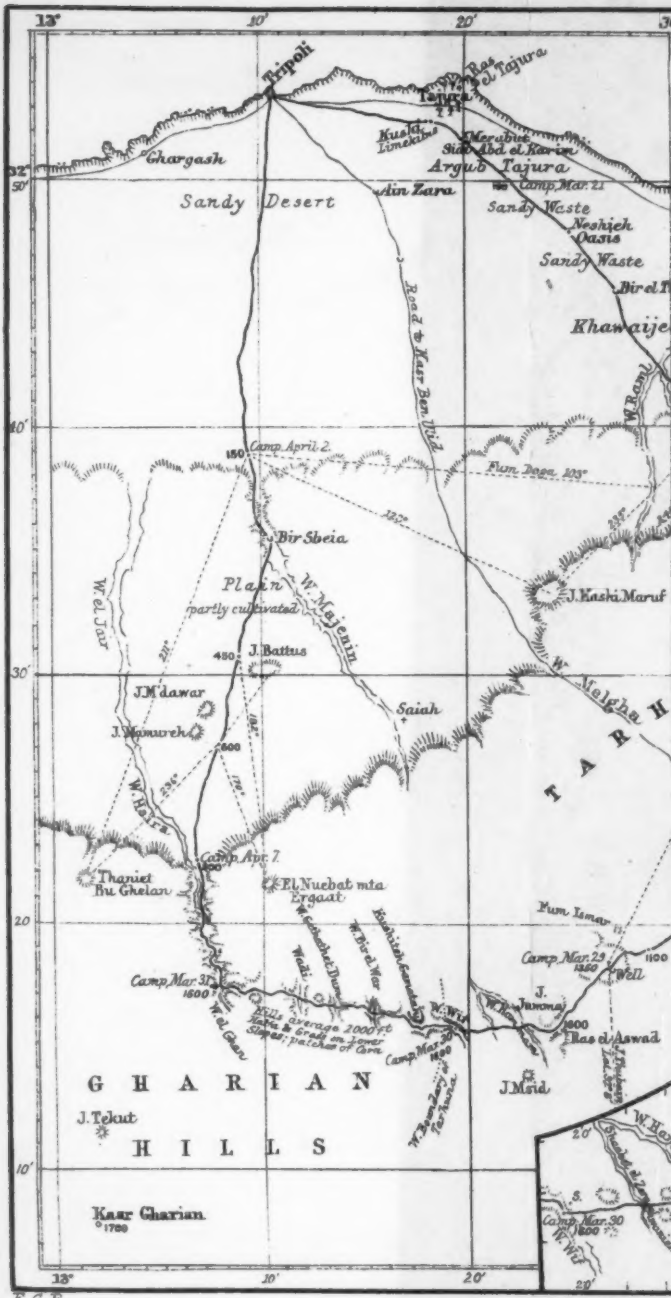
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Argub Tajura
Ghargash
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Sandy Waste
Neshieh Oasis
Sandy Waste
Bir el T
Khawaije
Road to Kasr Ben Ghid
W. Rami
Camp April 2.
Fum. Doga 103°
Bir Sbeia
Plain partly cultivated
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J. Kaski Maruf
J. Battus
J. M'dawar
J. Manureh
Saiah
W. Melgha
T A R H
W. Hera
Camp Apr. 7
Thaniet Bu Ghelan
El Nuebat mts
Ergaat
Fum. Iamar
Camp Mar. 29
Well
Camp Mar. 31
Wadi
W. Tar el Mar
W. el Ghaw
Wells, average 2000 ft. Barley on lower Slopes, patches of Corn
Camp Mar. 30
W. Bon Zaid
W. Hamada
Ras el Aswad
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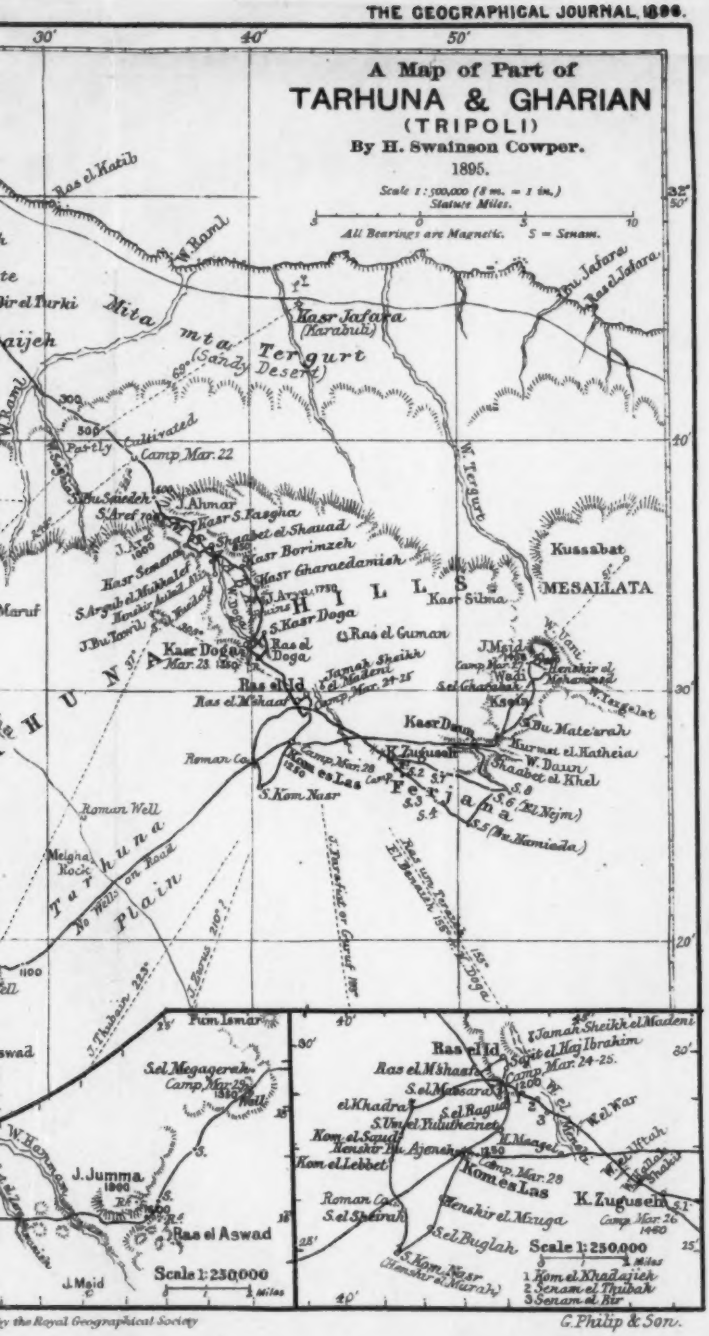

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